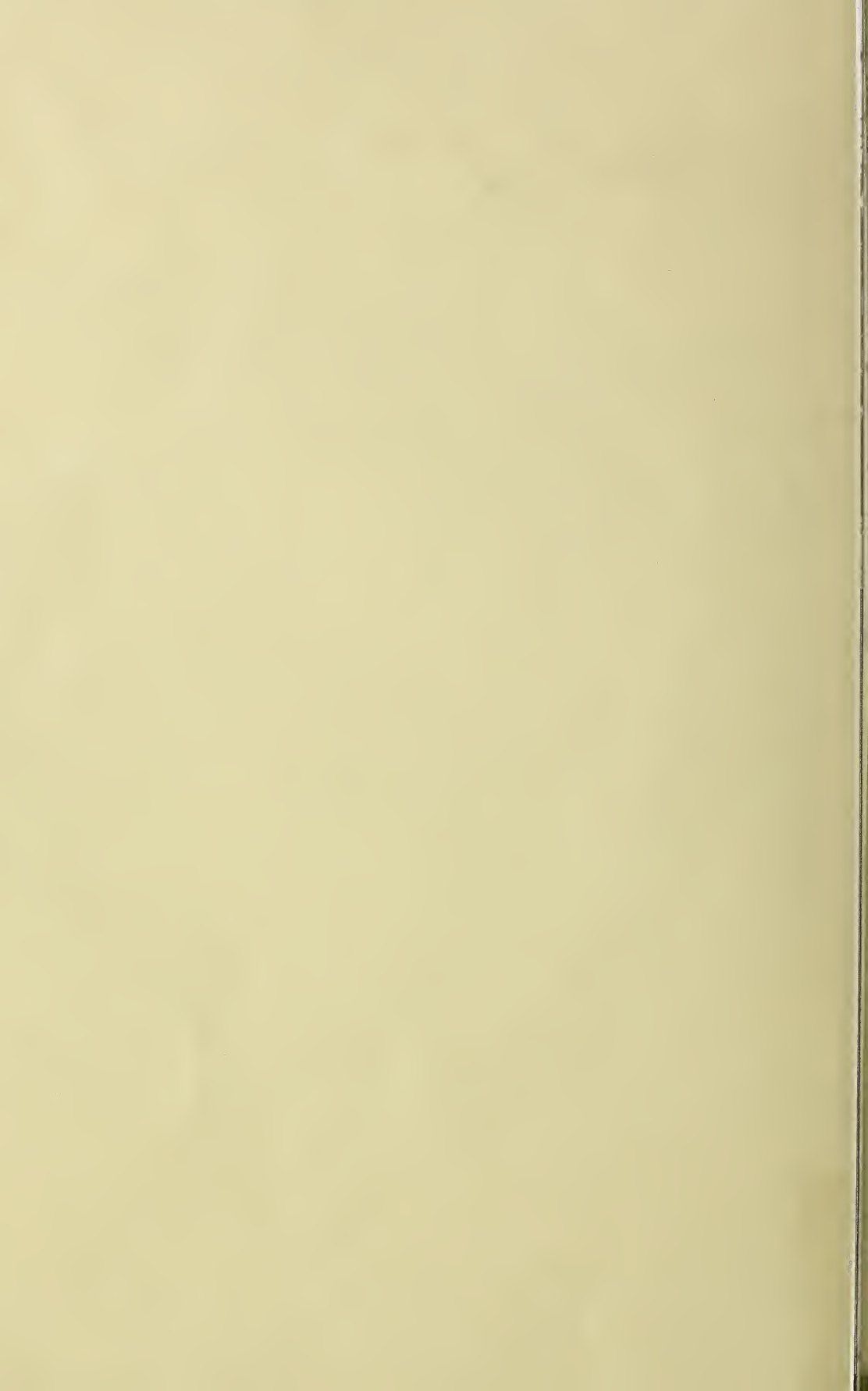


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Volume XXII

Number 8

The Agricultural Student

OHIO STATE UNIVERSITY, COLUMBUS, OHIO

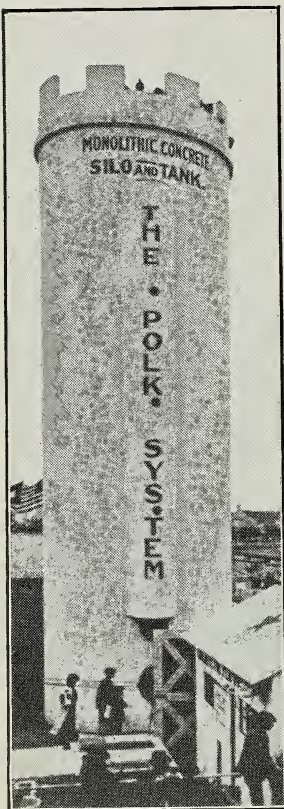
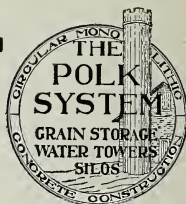


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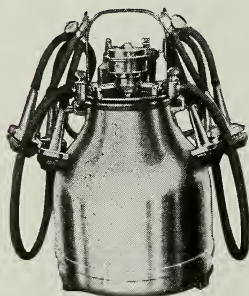
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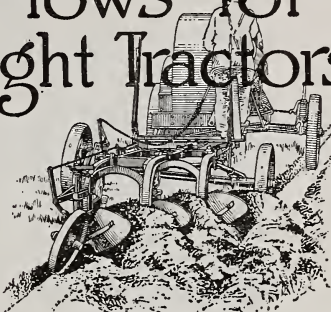
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Rustic Bridge Over Mirror Lake, Ohio State University Campus

THE AGRICULTURAL STUDENT

Vol. XXII.

OHIO STATE UNIVERSITY, COLUMBUS, APRIL, 1916

No. 8

SWEET CLOVER POSSIBILITIES FOR OHIO FARMS

Comparison With Other Forages, Its Value for Sheep Feeding, and for Swine Pasture; How It Can Be Adapted to a Variety of Soils and Its Value As a Green Manure

PROF. FOREST W. STEMPLE, Department of Agronomy, Ohio State University

SWEET CLOVER is a native of the Mediterranean region of the Old World and was introduced into the United States as early as 1738. Since that time until ten years ago it has been considered a pest. Today it is extensively grown in Alabama, Mississippi, Kentucky and Utah and but less extensively in Nebraska, Colorado, Wyoming, Illinois and Indiana. In Ohio, Lloyd reports that he has found, through correspondence, that it is growing in every one of the 88 counties of the state.

It is now growing in every state in

the limestone hills in Hamilton, Clermont, Adams and Brown, the river valleys of the Scioto, Miami, Muskingum and Hocking, the sandstones and shales of Meigs and Athens, and in similar situations in Wayne, on the red hills in Washington, Morgan and Athens, and on the acid soils in Medina, Summit and Cuyahoga Counties." What, then, are the possibilities of this crop? Can it be used?

In making a comparison of the feeding values of various crops this table has been made from Henry's Feeds and feeding:

COMPARISON WITH OTHER FEEDS.

	Total Dry Matter. (Percent)	Digestible Protein. (Percent)	Digestible Carbohydrate (Percent)	Digestible Fat. (Percent)
Alfalfa	91.6	11.0	37.6	1.2
Red Clover	84.7	6.8	35.8	1.7
Timothy	86.8	2.8	43.4	1.4
Wheat Bran	87.7	12.3	37.1	2.6
Corn	89.4	7.8	66.7	4.3
Sweet Clover	90.8	10.	37.	1.5

the Union, for its adaptability to climates and soils is unusually wide. In its adaptability to soils it has been found growing on almost every conceivable sort of soil found in this state. Lloyd reports that "in Ohio it was found growing on the sand dunes in Fulton County, the old lake beds in Paulding and Henry, the level black lands of Montgomery, the gravelly moraines in Morrow, Delaware and Logan,

So far as digestibility is concerned, there is little difference in the value of alfalfa, sweet clover and bran. From the analyst's point of view, they stand close together. But this cannot be the whole proof that sweet clover is as good as alfalfa and better than red clover. More than this has to be shown. The actual feeding test must be made.

Let us, then, examine some of the results obtained by careful experiment-

ing. In Bulletin 79 of the Wyoming Experiment Station we find the following table given for lamb feeding:

COST OF FEEDING LAMBS (Wyoming Station).

Lot.	No. in Lot.	Ration.	Cost of Feed for 100 Lbs. Gain.
1	40	Alfalfa, hay, corn	\$4.26
4	10	Alfalfa, hay, corn	4.01
5	10	Sweet clover, corn, oilmeal	4.93

Here the cost for the production of lambs was somewhat greater for the use of sweet clover than for the alfalfa, and is explained to a certain extent by the fact that the sweet clover was cut late and was coarse, thus causing a little in favor of the palatability of the alfalfa. But the lambs liked it, showed a steady appetite for it, and no difficulty was experienced in getting them to eat it.

At the Iowa Station experiments were carried on comparing sweet clover and red clover as pasture for hogs. This experiment was divided into two periods according to the stages in the preparation of fat hogs.

SWEET CLOVER AS A HOG PASTURE (Iowa Station)
First Period—June 22 to September 14.

Kind of Pasture.	Total Grain Pounds	Shelled Corn Consumed Pounds	Meat Meal Consumed Pounds	Amount for 100 Lb. Gain		
				Grain Pounds	Meat Pounds	Meat Pounds
Sweet Clover	811	2607	321.5
Red Clover	872	2266	259.9

(Entire Results) Second Period—September 14 to November 10.

Sweet Clover	1783	5529	640	310	36
Red Clover	1430	4900	567	342	40

Because the sweet clover outclassed the red in its ability to furnish green pasture for a longer period, less grain and less meat meal needed to be used for 100 pounds of gain with sweet clover than with red. These results were obtained on the first year's growth, and subsequent growths were too woody and stemmy to make such a showing.

No further data on work done by experiment stations or agricultural colleges on sweet clover as a feed has been

found. But there is observational data from practical sources on the use of this plant as a food, and while I am not

inclined to think that such data is really anywhere nearly as valuable as the work of men trained to carry on careful and painstaking investigations, I am sure that there must be some value in these observations.

We hear a great deal about the unpalatability of sweet clover, its bitterness, how animals will not touch it unless starved to it. There is something in this, for if it were not true we would not see so many unsightly areas in pasture fields and places where animals have a chance to graze. But from Lloyd we learn that out of 69 counties in this state came 257 replies to questions on this point, saying that cattle were graz-

ing on it, and Mr. Lloyd himself saw, in his investigational travels in Kentucky, horses, cattle, sheep and hogs all eating sweet clover as readily as stock do red clover and blue grass, and apparently doing as well as on these. Its early growth in spring, two weeks before other grasses are offering green feed, make it unusually good for pasturing if the animals will take to it, and its succulence throughout the dry season, and its late growth, make it trebly

valuable. Vinall, of the United States Department of Agriculture, says of sweet clover as a pasture: "Turn the cows, sheep or hogs onto the sweet clover when there is no other green matter available, and they will eat it readily and come to like it. Then one has only to keep it pastured down or mowed off during the summer to insure a continuous succession of luxuriant green pasturage. The chemical cumarin that sweet clover contains has long

soils. As pointed out, sweet clover will grow on any of our Ohio soils. It grows luxuriantly in waste places, along roadsides, on gullied hills, on land entirely lacking in humus, on land over-cropped or too long cropped to one plant; in fact, under the worst of adverse conditions. Indeed, it is just on this point that the value of sweet clover over all other legumes rests. Where alfalfa, red clover or alsike will do well, or where any of the other of the high class le-



**Effect of Lime on Sweet Clover at the Ohio Agricultural Experiment Station, Wooster.
The Center Plot Was Not Limed**

been known as a corrective for digestive disorders." This, perhaps, accounts for the fact that there is little bloating of cattle pasturing on this crop.

In Farmers' Bulletin 485 we read: "Whether there is some narcotic principle in the cumarina (the bitter part), it is well known that stock induced to eat this plant become quite fond of it, and will often leave all other grasses and clovers to eat it."

But the greatest possibility for sweet clover lies in its power to build up and renew the fertility of old, worn out

gumes will do well sweet clover apparently has no place.

There are a number of things about a soil that make it productive, such as good drainage, proper fertility, proper physical condition and so on. One of the most important of these essentials is sufficient amount of organic matter. Soils lacking in this are usually unproductive. But, strangely enough, soils of this sort are able to produce sweet clover. In this is the really great possibility of sweet clover.

From the Utah Experiment Station, and the Arizona Station, in the dry

regions, and from the Michigan, Iowa, Illinois and Ohio stations come reports that the yields of sweet clover in rather adverse conditions run anywhere from three to six tons per acre, and the one thing I want to be outstanding is that sweet clover, in the conditions where it is most needed for green manure, in the adverse conditions where organic matter is entirely missing, will give heavy yields like the ones mentioned, while other green manuring crops will not grow. Especially in deep gullies washed by heavy rains, in counties where erosion is worst, is this going to be of utmost importance. Its growth in the subsoil exposed, its deep-rooting habits and its immense growth will be one of the best means of stopping the devastation due to heavy runoffs.

Hopkins of Illinois, commenting on

some investigations carried on at that station, in which it was found that sweet clover left in tops and roots 6.4 tons of dry matter per acre, says: "While sweet clover makes a fair quality of hay, if cut sufficiently early in its growth, and is also used for pastures with some success when nothing better can be had, it is not to be compared with red clover or alfalfa for either purpose, but it does give great promise of great value as a green manure crop, and it seems appropriate to emphasize the fact that the 6.4 tons of dry matter furnish as much humus forming material and as much nitrogen as would be furnished by 25 tons of farm manure.

The following results obtained in tests further show the fertilizing value of this crop:

SWEET CLOVER AS A GREEN MANURE AND ITS VALUE.

Treatment.	Crop.	Place.	Yield—Pounds.
None	Oats	Germany	1,099 grain, 1,748 straw.
Green manure	Oats	Germany	1,645 grain, 3,381 straw.
None	Potatoes	Germany	6,923 tubers.
8 ton manure	Potatoes	Germany	12,236 tubers.
Green manuring	Potatoes	Germany	14,490 tubers.
None	Wheat	O. S. U.	1,116 grain, 1,524 straw.
Green manure	Wheat	O. S. U.	1,614 grain, 2,606 straw.



"At Eventide"

(Courtesy Eastman Kodak Company.)

PROFITABLE MEADOWS AND PASTURES FOR OHIO

Legumes and Forages That Make a Permanent Agriculture

JACOB P. SCHMIDT, '16, Ohio State University

THE foundation of good agriculture is good grass. Figures are unnecessary; take from every farmer of every farm his pasture and his meadow, you take the joy and the profit of the land. But here are figures from statistics of the last United States census report: Farm lands constitute 46.2 per cent of the total area; improved farm land, 25.1 percent; non-farm land, 53.8 percent; unimproved pasture land, 37.4

timothy in this country the same year was estimated to be \$300,000,000, or about two-thirds the value of wheat or cotton and one-third the value of corn.

Timothy and clover constitute one-half of the total acreage of American forage crops, and they are practically limited to the northeast quarter of the United States. The forage crops, as it is seen, are made up not only of grasses,



"Good Grass is the Foundation of Good Agriculture"

percent; improved pasture, 9.2 percent. The improved pasture land is barely a sixth smaller than the total farm land area, the improved pastures one-third the size of the total improved farm lands. Voorhees says of the New Jersey Experiment Station that 71 percent of the farmers raise hay; more land is devoted to the hay crop than to any other single crop; it receives less care than any other crop, and yet it responds readily to good treatment. In Ohio (1909) timothy alone was grown on 140,000 farms, and timothy and clover on 83,000 farms. The value of

but also of legumes. There are 6500 species of legumes and 3500 species of grasses in the world. There are but few of them useful plants in the United States, but such a number are used to advantage in other countries, and many of them can be grown in the United States.

Yields are secured in other countries that seem impossible to us here, accustomed to the results of the plants own unaided efforts. There is Italian rye grass, adapted to a mild, moist region, which, in England, under irrigation and treated with liquid manure,

makes yields of grass which total 60 to 120 tons per acre, and hay yields of 12 to 20 tons. Joseph E. Wing stated that the first step for increased production of grass-fed beef cattle and mutton in the East is the better use of pastures.

Are we to believe from this that greater livestock production is coming eastward and that the great plains of the West are to lose their preponderance of production of that one commodity? Certainly there is nothing

springs and their clay subsoil, we should grow grasses.

The beef raising region of Virginia would consider it a calamity if her pastures were to be plowed. Even if not too steep for cultivation, the fields are often very stony; still they are said to produce \$15 worth of beef per acre. The oftener the hillside is cultivated, the more fertility is washed away, the rougher the field becomes and the more horseflesh and man-power is consumed in tilling it. There is absolutely no



Harvesting Alfalfa on an Ohio Farm

more reasonable when we consider that in the West it takes many acres to support one steer, and then the acres are wasted if water is not accessible, while in the blue grass hills of Virginia one acre will make 500 pounds of beef in a season. In the semiarid regions of the West, where the drouth resistant bunch grass makes a natural growth of a few inches, sorghum under cultivation will make a growth of eight or ten feet. Alfalfa thrives quite well and makes much more forage. Deep-rooted crops should be grown in such regions drouth, while on our hills, with their

chance for the cradle on the stony hillside to compete with the binder on the level. Forests are the cheapest methods of conserving fertility, but so many forests are gone!

Because the hills should be resigned to grass it must not be supposed that the level lands will need to increase the acreage of other than forage crops. Diversified farming has proved to be the safest and most desirable for the average farmer. If more acres should be set aside for meadow and the remainder of the crops given better care, the same total production could be se-

cured and, in addition, a supply of hay at little expense, which might otherwise have cost the farmer more than the profits per acre from the so-called money crops.

In a four-year trial at the Ohio Station, average yields for some of the grasses were secured as follows: Timothy, 3.5 tons per acre; redtop, 2.8 tons, and more than 2 tons each for tall fescue, brome grass, orchard grass, blue grass and meadow fescue, and about 2 tons each from tall oat grass, Italian

and compares favorably in fat with timothy. (Ohio analysis.)

One must be careful to make the right kind of mixtures. It would be folly to grow a mixture with one constituent far superior to the others in palatability; the remainder would not be eaten. Still, there are reasons for a mixture; it makes a full swath; if both deep and shallow rooted crops are used, the soil is better sterilized; legumes and grasses combined tend to balance the ration; permanent grasses may be late in set-



Livestock Production Is Dependant Upon Good Grass

rye grass and perennial rye grass, the last being tried out only toward the end of the experiment. As to the feeding qualities of these many kinds of grasses, we need only to recall our own failures with the commoner ones, and remember that there is a right time and a wrong time to harvest any crop.

Prejudice once established, without thought, is hard to argue away. As a hay redtop is perhaps most strongly discriminated against. It has been cleaned up with a relish by horses, and they were in good shape, too. It contains more protein and carbohydrates

ting on, and may cost less if sown thinly in the first place. If it happens that one plant finds disfavor in the pasture, and if it is aggressive, it may dominate the pasture in a short time. The remedy is to alternate the animals or pasture different kinds of animals at the same time. Cows and sheep, particularly, are often fond of plants which horses won't touch. Too, this may be the secret of so-called light and heavy grazing. Often it is held that pastures are ruined by over-grazing, that nothing but weeds persist in the pasture then. If heavy grazing begins too early

in the spring this might well be true, but the Virginia Experiment Station, in connection with the United States Department of Agriculture, started a series of experiments along this line in 1908, and results published in a Virginia bulletin, 1974, show that too often undergrazing is the cause of the appearance of weeds.

In New York hay is the money crop, and it is because it receives attention. Fertilizers applied to the hay crop in a rotation often leave a residue well suited to the needs of the following crop. Nitrogen gives quick and excellent returns on grasses, while lime and phosphorus or potash are essential to legumes.

All phases of culture must be dealt with; the crop must be started before later treatments can be applied. As a general rule it pays to plow deeply, fine and firm the surface as a seedbed for grasses, while mere surface stirring is often the only requirement for some legumes. Time and methods of seeding so often depend upon weather conditions, yet they are so infrequently associated in the minds of farmers that advantage is too seldom taken of the conditions.

Today nothing seems more important than securing the best seed for a successful crop of corn, oats or when, but nothing is said about the smaller seeds. No wonder stands are poor, coupled with poor preparation of seedbed, often sowing seeds low in viability and purity. Suppose that seed is 90 percent pure and germinates 80 percent (above the average for a great many seeds),

the stand could not possibly be more than 7 percent. This brings up the question of rate and cost of seeding. First class seed catalogues today recommend rates and mixtures, time to seed, and also give the cost. One should supplement such information, however, with experiment station records, if possible, and with his own experience.

After all, we are simply attempting to direct attention to a valuable but much neglected crop of the average farm. Anything but meadows or pastures is considered a money crop. Many clay lands need but a coat of manure to produce a two-ton timothy crop, while the same land does well to produce 35 bushels of corn. Consider the expense of the two crops. It is the farmers' own fault if grass is hard on the land; he constantly removes everything, but puts back nothing.

Corn requires the best kind of soil and wheat another. Given an unsuitable piece of land, one needs only to select another kind of grass and a hay crop can be grown. With the proper treatment one might be able to secure a good yield of hay when others fail, and he could dispose of it at a profit, retaining a cheaper forage crop or growing a catch crop for his own use. Meadows can be substituted when time and expense will not permit utilization of the whole farm for certain other crops. Many legumes are adapted to late sowing, fitting in well as substitutes after other failures. The average farmer must have pasture for his colts, calves, resting horses, cows and sheep. Why not see that the pastures are profitable?

LANDSCAPE ARCHITECTURE FOR THE RURAL HOME

Making the Farmstead Attractive by Simple Plantings

STANLEY W. LEONARD, '16, Ohio State University

THE thought of preparedness for the United States brings the thought of war equipment to ones mind. Preparedness for the farmer, however, should bring the thought of making his home so attractive that his sons and daughters will be proud of their home;

They feel this lack when they drive through the beautiful suburbs of the neighboring city. They lack that for which they are willing to drive miles out of the way in order to see—a successful combination of beauty and utility.



Openness Obtained by Informal Planting of Tree and Shrubs

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a condition that would go towards keeping them on the farm.

The farmer may be progressive in many ways; he may own an automobile, a tractor and other labor saving devices; he may have a furnace, electricity and modern conveniences in his home. Yet he and his family still feel that they lack something to complete the enjoyment of their home—the farm.

How many country roads would they go out of the way of in order to travel on a better road? They do not go this way or that way to see a road bordered by charming country cottages, for they are rare; but merely to make use of a good road, a utilitarian feature of farm life.

Analyze the average country yard and see why it does not possess more

charm. First, we find that the area about the house is too small. A small, cramped yard in the country is an ugly misfit; everything should exemplify the quality of spaciousness for land is cheaper than in the city and therefore it is possible to have large yards. This condition is especially noticeable when the adjoining barn lot is two or more times larger.

With the yard increased in size we should be able to make attractive improvements. Will a change in the drive improve it in any way, either for use or for beauty? Layout the drive in the most direct route; curves are permissible if they give the advantage of a more gentle slope, or to pass in and around trees.

If the farmhouse is situated close to a much traveled road, a border of trees along the road will give the desired privacy, and will intercept the clouds of dust during the summer.

The adjoining barn lot can be screened from the front yard by planting trees and tall shrubbery. Obnoxious views can be screened by heavy planting. If good views can be obtained from any portion of the house or barn they should be kept unobstructed by open planting.

The drive entrance can be made artistic by planting rather heavy masses of shrubbery that flank it on either side or by constructing masonry piers and skirting them with shrubbery. A neat gate between masonry piers gives a trim appearance to the visitor or passerby, and he will be led to expect that the quality of trimness is not restricted merely to the entrance. When we have a long lane from the road to the farm house the entrance should be planned for an effect that will possess dignity. Hedges make a more pleasing barrier for the yard than any fence that has ever been manufactured.

A feeling of spaciousness in the yard can be secured by refraining from planting in the center of the lawn. Restrict the planting as much as possible to the edges of the yard. The planting of shrubbery of a not too coarse a nature about the house serves to hide unsightly corners and emphasizes the limits of the house. The steps should also be flanked by a planting.

In the choice of shrubbery and trees for the yard we should be careful to keep the larger plants in portions of the yard further from the house. Near and about the house we should select plants that will give a finished effect.

Deciduous trees planted south of the house provide shade in the summer and allow the sun to shine upon the house in the winter. Evergreens will lend charm to any planting. Besides the smaller growing varieties, that may be placed in the groups about the house and in other parts of the yard, we should plant specimens of evergreens which grow to a good height, to the north and to the northwest of the dwelling. When mature they provide a beautiful background, both in summer and winter. In Ohio the bareness of the landscape testifies too often to the lack of evergreens in both our forests and artificial plantings.

What shall we plant in the yard? Hardy shrubs which are recommended by reputable nurserymen in your locality can be used, but refrain from planting horticultural novelties, such as the weeping mulberry or Burgei Catalpa. These rarely find a suitable place in a planting in the yard about a farm house.

Keep the geraniums and other bright flowers in the garden, which should be developed apart from the informal area in front and to the side of the house. The bright colors of these plants, if used in the planting would compel our at-

tention to be directed to them rather than the yard and the house.

Treatment of the Porch.

In the choice of vines for the front porch we should aim to select only those that are hardy, as annual vines require much time in training and do not usually provide shade until the hottest days of summer are over.

Dutchman's pipe vine, Clematis pan-

Where everything is clean about the house—due to the labor of the farmer's wife—but across the fence in the barnyard we often find a picture of disorder. How can we remedy this situation? First, clean up the barn lot. Paint the service buildings (barns and cribs) in a light gray which gives the buildings the appearance of cleanliness and causes them to be less conspicuous,



Screen Effect of Lombardy Poplar. They Grow Rapidly

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iculata and Hall's Japan Honeysuckle are good varieties of hardy vines that will give a dense shade. The climbing roses are rarely satisfactory for the porch. If there is not enough room in the yard for separate flower and vegetable gardens they may be united into one with very satisfactory results. The garden should be surrounded by a hedge over a neat trellis. Cover the trellis with some annual or perennial vine.

a position they should hold, since few of them possess architectural beauty.

A barn lot should be screened so as to partially hide those objects which stand out because of their size and to throw interest on that which is or should be more interesting—the house and front yard. The trees that are planted to screen the barn lot from the road and house may also serve as a windbreak in winter and shade for the cattle and horses in the summer.

AGRICULTURAL ACTIVITIES AT CORNELL UNIVERSITY

How Three Thousand Students Organize for Competitive Events

J. A. VANDERSLICE, Editor The Cornell Countryman, Ithaca, N. Y.

IN a student body as large as that of the College of Agriculture at Cornell University the student activities are varied and afford unlimited opportunities for every one of its members to have a part. The total enrollment for the year 1914-15 was 2830, but it is now over 3000. The four-year students number about 1500, but the total enrollment includes all special students and those who take the winter courses.

There is a sharp distinction at Cornell between college and university activities. The latter are more important and include all the highest honors to be obtained in undergraduate life. To a certain extent they are more exclusive and limited. The college activities include all other undergraduate activities pertaining to the College of Agriculture. They furnish a variety of opportunities for the outlet of the energies of the "ag" students.

The student activities of the college are under two governing bodies: The Students' Association and two honorary senior societies. The Association is the governing body in reality, while the societies, being elected from the most representative students of the college, as well as the university, are more advisory in nature.

Taken as a whole, the student activities of the New York State College of Agriculture divide themselves into two groups—the athletic and the non-athletic. At the present time, and for some time past, agriculture has led the other colleges of the university in athletics, and at the present time holds nearly all of the prizes awarded by the Intercollegiate Association of the University.

During the past year the College of Agriculture was represented in intercollegiate athletics in crew, track, cross-country, basketball, soccer, baseball and indoor sports carnival. In all of these activities there has been a lively participation. This participation in college athletics has a decided benefit to the teams, in that it develops athletes who often are added to varsity teams, and a benefit to the students because it provides wholesome participation for men who do not make varsity teams. The carnival is an annual indoor meet, held during the winter, and consists of rope climbing, tugs of war and sports of similar nature. Plans are now under way to further encourage athletics by providing footballs, baseballs, tennis rackets and athletic supplies to be kept in the college buildings at the disposal of any members of the Students' Association. Membership in the Association consists in the payment of an annual tax of fifty cents. This defrays the costs of equipping the teams and of incidental expenses in the government of the Association.

One of the more important features of the non-athletic activities are the departmental clubs, so-called because they have enrolled in their membership undergraduates and winter course students who are taking their major work in the particular department which the club represents. The purpose of these clubs is to furnish a medium through which students may meet informally and discuss the problems in which they are interested. Oftentimes the program for the meeting of these clubs, which usually comes on Monday of every week, includes a talk by some

member of the faculty, followed by discussions and "eats."

Two of the oldest clubs in the college are the Lazy Club and the Round-up Club. The Lazy Club is made up of students interested in horticulture, and is divided into two groups—floriculture and vegetable gardening. A side branch of the Lazy Club is the Pomology Club, although it now has no connection with that organization. All of these clubs

place other than that of Frigga Fylge. The short course students have organizations similar to the Lazy and Round-up Clubs. The journalistic activity of the college is the Cornell Countryman. The board of editors and managers who publish the magazine are chosen by competition from the student body at large. The offices are located in a building near the main group. It is given to the Countryman by the college.



Quadrangle View on the Campus of Cornell University

(Courtesy of The Cornell Countryman.)

take up problems along their lines. The Round-up Club is an organization for students in animal husbandry.

The girls' club is known as Frigga Fylge, and is made up principally of the girls in home economics. It is an active organization and has lately been conducting a campaign to raise money to build a club house. This is a step in advance of any other organization of the college, as there are at present no plans for any club house or meeting

Opportunities for those students who are interested in public speaking are to be found in the various debates and stages held during the college year. Foremost among these are the Pomology Stage and the Eastman Stage. For the Pomology Stage four students are selected by competition to speak on some phase of fruit growing at a meeting of one of the fruit associations of New York State in January. The prize is \$35. The Eastman Stage is likewise

competitive and the prize is \$100, the competition being held at the college as a feature of Farmers' Week.

There are miscellaneous activities of the college which must not be overlooked. The monthly assemblies of the Students' Association form a feature in the undergraduate life. While these assemblies are under the general direction of the dean of the college, they are held under the auspices of the Association. The assemblies serve a useful purpose in that they afford an ex-

to be found in committee work, in the annual fruit show held each year by the students in the department of pomology, and by the judging teams sent out from Ithaca.

These activities among the student body of the New York State College of Agriculture make for better friendship and closer acquaintance. The athletic activities give an outlet for those so inclined, and the figures show that athletics have actually raised the standards of scholarship. The 53 students



Chrysanthemum Exhibit by Students of Floriculture, Cornell University
(Courtesy of The Cornell Countryman.)

cellent opportunity for the faculty and students to meet on common ground outside of regular hours.

Before the Christmas holidays every year a banquet is held for the faculty and student body of the college. This banquet is given under the supervision of a committee appointed by the president of the Association.

Farmers' Week, with its 5000 visitors to the campus, is in part a student activity, because the co-operation of student committees helps to make it a success. Other miscellaneous activities are

who participated in athletics last year had an average of 1.6 percent higher than the rest of the student body. At no time has soccer, basketball, track or any other sport, been handicapped for lack of men. This interest makes competition keen for places on the teams and accounts to some extent for the marked success of the "ag" teams. The contribution to varsity athletics, as already pointed out, and agriculture has had a larger percentage of men on varsity teams than any other college of Cornell University.

REFORESTATION OF OHIO'S WASTE LANDS

Growing Trees Will Prevent Erosion and Loss of Fertility

PROF. WILLIAM R. LAZENBY, Department of Forestry, Ohio State University

AT the time of the first settlement by the white man, Ohio was found to be enriched by two great natural products — coal and hardwood timber. While both of these are exhaustible resources, they differ in this: Coal is exhaustible without the possibility of restoration, while timber, equally exhaustible, may be reproduced or restored by intelligent care.

Man cannot live upon coal and timber. The three great resources upon which our humankind is most dependent are the soil as a food producer, the water, essential to every form of organic life, and climatic conditions. Ohio is blessed with a naturally fertile soil, with a fair measure of water (our rainfall), and a varied, yet productive, climate. These are our great inheritances, because they came to us without labor or effort on our part. Have we guarded and are we guarding these inheritances as we are in duty bound to do? Each generation should be the trustee and guardian of these great natural resources of our commonwealth for the generations to follow. Can the generations that have lived in Ohio give a good account of their stewardship? Let us briefly consider, from the viewpoint of the forest. The state of Ohio is in the semblance of a square, about two hundred miles on a side and occupying an area of 41,000 square miles, or 26,278,400 acres. Of the forty-eight states of our Union, thirty-four are larger and thirteen smaller than Ohio. Probably no equal area on our earth's surface contained as great a variety or as large a number of good deciduous trees. Here our finest hardwood timber reached its maximum development.

When the first settlement was formed at Marietta in 1887, Ohio was practically an unbroken forest. With no great rivers and only a few small lakes within her border, the area upon which there were no trees was almost negligible.

Of the 26,278,400 acres in the state, no less than 25,000,000 were occupied with timber trees. But the decrease of this mighty forest area was rapid and relentless. In 1850 not more than 14,000,000 acres remained. In 1870 the area was reduced to 10,000,000, and in 1880 a scant 5,000,000 acres of forest were found. Since then the work of destruction has gone on, and although the actual area of land cleared has not been so large, the forests have been cut over, pastured and so injured by fire and other enemies, animate and inanimate, that less than 2,500,000 acres of anything that can, by any stretch of the imagination, be called forest, remains. In fact, Ohio may be classed among the states of our Union that have no more than 12 percent of their area in actual forest.

The states in similar or worse condition than Ohio are: Illinois, Kansas, Oklahoma, Nebraska, North Dakota, South Dakota and Nevada. The states named have either large areas of prairies or extensive desert regions, with insufficient precipitation to support a forest. Under such conditions there is not, and never will be, sufficient woodland to influence materially their general conditions. The states of our Union that contain a reasonable percent of forest area today are for the most part so mountainous, so rocky, so hilly and broken, or so sandy and

sterile that they will never be so denuded of forests as the rich, comparatively level, facile soil areas of the great Mississippi valley—or what is often termed the Middle West. Although the southern half of Ohio is broken and hilly it has been deforested almost as completely as the level or glaciated northern half.

A more or less careful survey of the state compels the judgment that not less than one-fourth of the total area should be perpetually devoted to timber trees.

Let us view our forest wastes from another standpoint. With the depletion of our forests the area of cleared land in Ohio has grown larger year by year, yet the aggregate production of our farms is growing less, and the average yield per acre of our staple products cannot be mentioned without a sense of shame. What are the reasons for this poor average farming, these meagre crops? One reason can be given with confidence, and that is "too much land."

I do not oppose, and certainly shall not quarrel, with the instinct which prompts comparatively large landholdings. Land is still cheap almost anywhere in Ohio. It is cheap, not perhaps in view of the income derived from it, but cheap where one contemplates the price it must soon command and the income it might be made to yield. In other words, land is looked upon as a good investment simply as land. Our landowners may not have too much absolutely, but they have too much relatively to their capital, and so cannot work it effectively or to the best advantage. We persist in half farming many acres instead of thoroughly farming one-half or one-third so many, and getting the rest under good forest conditions so fast as may be. I believe one can safely assert

that three-fifths of the farmers of Ohio would increase their net returns and improve their circumstances in every way by concentrating their capital, their labor, their fertilizer, upon one-half to two-thirds of the area they now skin and skim. The remaining half or third should be used to repair our forest wastes. Again, the removal of our forests has had a conspicuous and well-ascertained effect upon the runoff of surface water and the consequent erosion or washing of the soil and silting of the streams. The litter on the ground in the forest, the cushions of moss and other herbage have the power of soaking up the rainwater and holding it much better than it can be held by soil without this cover. The rain does not fall upon the forest soil with the same dashing force that it does upon the open land. The momentum is broken by the branches and foliage of the trees and the water comes to the ground in a somewhat delayed and measured way. The tangle of leaves, branches and fallen trees in the water channel is another check to the superficial runoff of the forest water. The slow melting of the snow under the forest shade is another factor of importance.

The loss by soil washing on the hillsides of southern Ohio is enormous. Wherever these hills are deprived of a considerable portion of their forests, erosion quickly follows. The soil is first washed down into the valleys, much of it finding its way into our streams and rivers, a little later the sterile subsoil is carried down from above, and thousands of acres of rich valley land are being covered with sand and gravel and gradually rendered infertile. This is one of the expensive results of the forest wastes in Ohio. This serious condition of over-erosion can be avoided by reforestation, and the burden of this work must be borne by

some public authority. Whatever is intelligently expended for this purpose will be returned with interest through the production that these reforested areas accord to the general welfare of our citizens.

—What can be said of the neglected woodlands of Ohio in relation to the wood-users and the wood-working industries of the state? Not many years ago Ohio stood well in the front as a lumber producing state. It has now fallen to the twenty-fifth in rank, and is relatively unimportant as a producer of wood. In spite of this fact there are a few states where the wood using industries have been better developed.

The various commodities made by these industries, together with the value of rough wood products, like lumber, ties, telegraph poles, etc., amount to something like \$150,000,000 annually. Not one-quarter of this wood used in Ohio is grown in the state. This means that we shall soon be compelling those that come after us to buy at double the cost at which we might and should have grown it. It means further that we will soon drive many of our more important wood-using industries out of the state.

At a moderate estimate there are at least 5,000,000 acres in Ohio that are either non-productive or are growing farm crops at a loss. This area should be growing our best varieties of hardwood timber. We have not only squandered our original inheritance, but we are continuing to waste by allowing our cutover woodlands to run wild by pasturing and by fire. It is wasteful to let black oak, hawthorne, dogwood, alder, mountain laurel, etc., start up and grow on lands that will produce white oak, hickory, chestnut, white ash,

hard maple, black walnut, tulip poplar, common locust and other good trees just as well.

The lessons of history are full of warning. Forestry has developed along similar lines in all countries. At first it was man's protection. It held the same relation to his life that it did to the wild animals upon which he lived. The direct demand upon it was insignificant. As population increased the demands became greater, the areas cut-over and cleared became larger and larger. The primeval forests were attacked along two distinct lines—first, the need for agriculture, and second, the need of more and more wood to meet the demands of an increasing civilization. The abundance of wood and the effort required to clear the land caused the trees to be looked upon as obstacles, if not real enemies. Wood was regarded as inexhaustible, and no thought was taken of reforestation. The older and more populous countries began to suffer first. The more advanced and progressive countries first saw the need of the conservation of the forest. Some sort of forestry is now practiced in every civilized country in the world. China, Turkey and Spain have done the least; Germany, France and Switzerland have done the most.

Russia, Austria, Sweden and Canada are meeting the world's deficit of wood today, and these countries are now cutting more wood than they produce. We, here in the United States, consume every year three times as much wood as our forests produce. All this leads to one certain end—a world-wide timber deficit. This can only be averted by a prompt and vigorous application of modern forestry.

COLOR SIGNIFICANCE IN SOIL FERTILITY

Variation of Black and Gray Soils in Crop Production

AARON F. HEAD, '16, Ohio State University

THE color of soils has long attracted the attention of agriculturists and geologists since it bears a close relation to soil formation and classification. A study of the color of soils has also been found of importance from the standpoint of crop production and adaptation, and from the cultural methods best suited to the different soils.

Soils have no real or distinct color, but simply shades of the true color itself. The most common soil colors are black, red, yellow, white and gray. Many intermediate shades of the above colors are found, and many soils of the same type vary in color in different localities, so that there is no true classification of soils from the color alone. The white and gray colors are often used interchangeably as meaning the same color, but are distinctive colors in themselves of many soils.

The white soils are more commonly known as "white lands" in the regions where they occur, which serves as a means of distinguishing them from the darker or gray soils. Frequently a combination of two or more of the above colors are found, imparting to the soil a mottled appearance. Brown and gray, or yellow and gray mottled soils are common in many sections of the country, but the degree of mottling differs considerably in the same type of soils in different sections. Some soils have an even colored surface, with a decided variation in the color of the subsoil. The color of the subsoil is not so important as the color of the surface soil, although it does bear a relation to the physical condition of the subsoil.

Soils originally derived their color from the rock of material from which they were formed, but many of the older soils have undergone a decided change in color, due to different physical and chemical agencies. Ordinarily iron oxides and organic matter are the chief sources of color for many soils. It has been shown in a fairly satisfactory manner that the soil particles have a thin coating of different colored oxides and hydroxides around them, which imparts to them their particular color. Small pockets of ferruginous material are common in many of our upland soils, and are responsible to a certain degree for the red color of these soils.

It has long been recognized that black soils are rich in organic matter, but not all black soils are highly productive, because some of them are so plastic and putty-like as to make them very difficult to cultivate. These soils usually occur in low, poorly drained regions, and even if properly drained, become so hard when dry as to make them practically impossible to cultivate. These soils usually occur in low, poorly drained regions, and even if properly drained become so hard when dry as to make them practically impossible to cultivate. Black soils usually derive their color from the decay of plant and animal life, which is the principal source of plant nutrients in the soil. In order that plant and animal life may properly decay, good aeration and drainage must be provided. If such a condition does not exist, a lighter color will result from the final decay, which carries along with it many toxic properties which are injurious to

plant growth. These facts show that a good black soil must be a well aerated and well drained soil.

Red, brown and yellow soils owe their color principally to the varying amounts of ferric oxide present. Brown and yellow soils are usually high in organic matter and lime, and in most cases well drained. While red soils are, as a rule, usually productive, different analyses show them to be rather low in organic matter. This can be accounted for from the fact that red soils are usually considered old soils, and have been undergoing a process of leaching and weathering for many years. Red soils are, however, well drained, for if they were not, the large amount of water present in a poorly drained soil would dissolve out the ferric oxide, which is the chief source of the color.

The white or gray color of soils is a good indication that there is something important lacking—organic matter. The lack of organic matter in these soils, together with their low, poorly drained condition, render them very unproductive for practical farm purposes. Proper drainage, where possible, and the application of organic matter will often render these soils more or less productive. It may be said, therefore, that coloration of soils is a guidebook to the fertility and drainage condition of any soil.

The color of soils is closely associated with heat radiation and absorption. A dark colored soil will warm up much quicker in the spring. This allows for

early planting of crops, and a better physical condition of the soil. Many experiments have been conducted to show the range of temperature of dark colored soils as compared with the light colored. Where soot or any other suitable dark colored material was applied to the surface soil, a difference of from three to five degrees was noted as compared with the untreated. This difference of temperature in the early spring, when the seed is being put into the ground, is of a decided advantage in the hastening of the sprouting process.

Bacterial and many chemical actions are affected by the color of the soil. Bacteria, as well as many chemical actions, require a warm soil for their proper growth and development. Light colored soils, poorly drained, afford an excellent harbor for injurious bacteria, as well as injurious chemical actions. A well drained, dark colored soil is usually suitable for the growth of beneficial bacteria and the promotion of desirable chemical changes. Color is therefore of an economic importance to both bacterial and chemical actions.

In purchasing a farm the color of the soil should demand very close consideration. Plowed fields or bare spots in the field will serve as a guide to the color of the surface soil. The soil augur should be used where possible to determine the color and physical condition of the soil at greater depths. Road cuts and stream banks are also a great aid in the study of the subsoil at greater depths.

METHODS OF COMPUTING COST-ACCOUNT RECORDS

How to Determine the Relative Profits of Farm Enterprises

EDWIN H. KRAUSE, '16, Ohio State University

AGRICULTURAL papers prate feverishly of farm leaks and inefficiency. Advertisers, agents and solicitors contract their attention for the welfare of all and in the interest of the various manufacturing companies. Most farmers admit that they could make more by changing their business in some manner or other. It all goes to show that farming is no longer a trade, but a complex business. The process of analysis is the first hand method for the break-away. The successes of the big enterprises are determined largely by systematizing and organizing by a process of label and record.

It would perhaps be unwise to adopt the exact label and record system on a down-pike farm that the United States Steel Corporation employs, but a rational working account can easily be made and profitably done.

Buy a "broad daybook" or "journal" and commence the record sometime between January and May. On the first pages of the book enter the inventory. This is merely a record of all goods on hand, with their respective values. Make the inventory after the following manner: Enter the real estate first. The real estate entry should include the farm plus all farm improvements. The value is placed in a column at the right of the page. For convenience there should be two columns ruled on the right side of the page. One is for the inventory taken now and the other for the inventory a year hence.

The next entry will be livestock. List each class of livestock separately, as: hogs, number of sows, gilts and boar, with their respective values. The other classes of livestock are entered in the

same maner. After the livestock, machinery follows. Under machinery all tillage tools, horse hay-fork, spray outfit, etc., should be listed separately quite into detail. Minor tools, as forks and grain sacks, may each be grouped. Estimate as accurately as possible the feed and supplies on hand, such as hay, corn, oats and twine; enter each with its value. Make a record of the accounts receivable and the cash on hand or in the bank. Deduct the accounts payable, such as mortgage, from the sum of the above values, the remainder will be the present worth. Reckon the value of hay and grain that is on hand at market value, minus the cost of hauling to the market. Machinery, tools and livestock should be figured at a price that the goods command on an open cash sale. Good judgment should be used in placing values upon the goods. Absolute accuracy is not necessary, but a deliberate over-estimate or under-estimate would be cheating one's self and would make the inventory valueless.

In one year hence another inventory is to be made. Follow the 1916 inventory as a guide and enter the values on the same line with these, and in the last column to the right. In the case of buildings, enter the same value as this year, deducting 2 percent for depreciation. Deduct 7 percent in the case of machinery. Find the net worth in the same manner as outlined for this year.

To find the net gain for the year 1916, take the difference between the two net worths and subtract from this sum the interest on the investment (5 percent) and all labor, as horse and members of the family, not paid for in cash. (Operator's labor is not included.) The re-

mainder is labor income. It is the amount the farm paid for the operator's skill and labor. This record is in itself complete and many farmers may not want to invest more time than this will require. It shows that so much was made during the year, but it does not tell which enterprise overdone its share and which underdone its duty. Every farm has one or more enterprises that yield no profit, some are manipulated at a considerable loss. The leaks of the farm will be plainly revealed by an analysis of each branch of the farming business. I shall submit in the following a simple outline for the internal business analysis.

Commence the financial account in the pages following the inventory. List the account for dairy cattle first for convenience. It is only necessary to keep a receipt account in the book. For example, a calf is sold for \$15; write the weight of the calf on one line, with the price received in a column to the right. All dairy receipts are written below this from time to time as the money is received. In case one makes a specialty of dairying, a book may be kept in the stable for the purpose of recording weights of milk, milk tests and amount of feed consumed. This is only to show the profit of each cow individually and should be kept away from and separate from the general account. On different pages commence the various enterprises, as poultry, hogs, and the various different crops, in the same manner as the dairy industry outlined above.

In the middle of the book commence the labor records. Allow several pages for the labor of each enterprise, listing, of course, each one separately. The labor of each crop may then be added easily. These records may be carried to details, but more often a good judg-

ment of estimates is worth more to the average practical farmer than elaborate technical accounts that cannot be interpreted readily by most persons. The labor under dairying, for example, may be abbreviated by averaging for two or three times the length of time that is required for milking, feeding and cleaning the stable, and multiply this by the number of times that it is done in that manner. When more cows are milked, time would again have to be taken and record in the same manner as before. Plowing, harrowing, cultivating corn and the like may be abbreviated in the same manner. Taking a tablet and watch with you to work is ridiculous. Employ the time you have riding a plow to see that it runs perfect; calculate your movements so that there is a minimum amount of motion lost, rather than to spend too much time on complicating the records.

At the end of the year each crop is to be charged for rent of the land, taxes, use of machinery, labor, fertilizer, seed, etc. In the case of livestock, make proportionate building rent charges to each class of livestock.

All money that is taken in should be placed in a bank. Small sums of less than a dollar may be left to accumulate into a sufficient amount, and then deposited as one sum. It is more general that money is received in lump sums than in small amounts, hence this should prove satisfactory and not cumbersome. All the money that is paid out is to be paid in checks. Checks may be written to self from time to time for personal expenses. The goods bought are to be written on the back of the check. All checks are to be kept at home or in the bank until the end of the year. By this method the bank will do a large portion of bookkeeping for the farmer for the use of his money.



OF

OHIO STATE UNIVERSITY.

A MEDIUM FOR EXCHANGE OF IDEAS BETWEEN COLLEGE AND FARM

Published by the Students in the College of Agriculture.

Established 1894.

Subscription Price, One Dollar the Year.

Entered at the Postoffice at Columbus, Ohio, as Second Class Matter.

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COLUMBUS, OHIO, APRIL, 1916

EDITORIAL

Additional advances in the prices of farm implements took effect about April 1. On tractors the increases, according to the reports, range from 5 to 15 percent, and on stationary gasoline engines about 12 percent. Cream separators have been marked from 10 to 15 percent higher, and other farm implements accordingly. Not only have prices been advanced, but all quotations have been subject to change. Two reasons are given for this advance in the cost of farm implements. The first is the growing demand for steel and other munitions to ship to Europe. Some of the manufacturers of farm machinery state that they are being ignored by the steel mills.

The second reason for the advance of prices is that so many factories are being turned into munitions works. One manufacturer in Ohio who had been manufacturing hay forks, hoes and similar farm tools has turned his plant to war orders and is turning out 200 swords a day. Another large factory is turning out shrapnel. Literally we are beating our plowshares into swords.

:|:

Perhaps no individual movement has attracted more attention during the past year in agriculture than the boys' and girls' club movement, which is being fostered by the U. S. Department of Agriculture, in cooperation with the state agricultural colleges.

CONTEST
WORK.

In Ohio the work is headed by W. H. Palmer of the extension department, who already has 43 counties signed up to carry on contests during the summer and fall months. Four lines of work, aside from livestock judging contests, are being carried out: poultry and pig raising and tomato and potato growing. Other lines will probably be established in a few months.

Such contests invite friendly competition in the counties in which they are conducted. They do away with the idea that the winning of high grades at school or the reciting of the largest number of poems are the only means of measuring efficiency. How often the champion swimmer, baseball player or the swiftest runner are looked upon with high favor, when their attainments are past in a few days. Things are changing, and the country boy and girl are coming to their own in their own environment. They do not need to go to the city to make names for themselves.

The winners of the contest are given a free trip to Farmers' Week, which brings them in closer touch with the agricultural college and the university of the state. The prizes they win at home, too, are generally livestock, which they keep, thus making a beginning of better livestock in their communities. In short, a new generation of farmers, imbued with the desire for real country life, will be developed.

Clean-up Week is practically a statewide movement, and the farmer should be among the first to join the army in the fight against disease. The edict of clean-up requests communities as well as cities in Ohio to make effective the spirit of the proclamation. Besides cleaning and renovating the home, it will not be amiss to make the back yard and adjoining

property the subject of a vigorous campaign.

A bathtub is better than a perfume bottle and a few rays of sunshine will be worth gallons of disinfectant, although the latter should be used freely at all times. While "clean-up week" by proclamation is a good thing, there is no reason why grounds and buildings once cleaned-up should not always be kept in sanitary condition.

The polluted water of a well cannot be purified by painting the pump. A fly in the milk may mean a person in the grave. An exposed manure pile may cause a big doctor bill. Diseased stock means small profits. These are some of the things that "clean-up week" prevent.

The Agricultural Student believes that the average farmer is awake to all the evils following uncleanness. Nevertheless, Ohio, with its increasing population, must observe health laws. By cooperation with the state laws the farmer can keep the Ohio death rate below normal as well as making more profits and enjoyments for himself.

What is an automobile worth to the farmer? Is its value to be measured in dollars and cents, or **THE FARM** according to the social **AUTO.** privileges it offers? Is a farmer justified in buying an automobile when there are other farm commodities to be purchased?

After keeping an accurate account of the expense of an automobile for a period of four years, a northern Ohio farmer says that it has cost approximately \$250 per year, which included depreciation on the machine. However, during that time he attended 61 band concerts at the county seat, 102 church meetings, four state fairs and 66 other rural events, aside from several hundred minor happenings. During the

four years he drove the machine approximately 10,000 miles. He estimates that without the machine he would not have been able to have secured one-fifth of the advantages.

Furthermore, through incidental contact he met several men on various trips to which he sold more than \$800 worth of purebred livestock, in turn secured a number of individuals which added materially to the quality of the dairy herd. He was able to forecast the needs and wants of his buyers and be ready when they were looking for good livestock. He also disposed of several hundred dollars worth of garden and orchard products by taking them in the auto to town.

He had five children, two of the high school age, and with the auto they could obtain the benefits of the best high school in the county and always be at home during the week-end.

The farmer now says he can sell his machine, which would give service for several years yet, and purchase another which will afford more pleasure and return greater business profits. When he builds a new dairy barn next summer he intends to build a permanent garage with it and make the automobile as much a part of his farm equipment as the barns or livestock.

When the subject of agriculture is mentioned to the farmer, his mind usually turns to the farm,

THE FARM HOME

with its complement of crops and animals, and rarely does he think of beautifying the house-yard or the road which runs along the farm. Although the farmer may be progressive in many ways, he may lack things about the farm that make it beautiful and pleasant to live upon, his family to realize the fullest enjoyment from their life on the farm.

There are many factors that favor making the farm a beautiful and attractive home. There is no smoke nuisance to contend with, as in the city; there is plenty of space upon which to work; all that is necessary is for the farmer to do a little planning and do the work which may be done at little cost if properly designed.

By doing these things the farmer will be an inspiration for the good of the community, and by making the farm a pleasant place on which to live he will keep his sons and daughters on the farm, not because he wishes that they stay there, but because they want to.





RAY FIFE, '17.

SANE PEDAGOGY IN AGRICULTURE

J. E. SMITH, Pandora, Ohio

THERE is always some "emotionalized standard" which forms the core of every curriculum. In the rural schools this standard is agriculture in all its diversified forms. The expression, "from educational agriculture to agricultural education," has been used very aptly to summarize the method of procedure in attempting to reconcile the various activities that make up the courses in agriculture in the elementary, secondary and collegiate schools of the state.

The experiences of the country child before his school days are all received through various phases of country life industries. In these experiences lies the beginning for all rural instruction. The principle of apperception demands that this starting point be utilized. This produces what is known as educational agriculture. Agriculture as it constitutes community life becomes the means of educating the rising generation in the life activities of the civilized race.

The instruction in these activities, or, technique in reading, writing, ciphering, conventional English, so-called scientific nomenclature, manual arts,

etc., constitutes the curriculum in practically all the elementary and high school teaching. The information or facts that are acquired are nearly all incidental to the mastery and practice in the use of the instruments of thought in the ideals of civilized life.

So much has been said in derision of ordinary farm practice and in the exploitation of so-called scientific agriculture that an exaggerated value has been attached to certain processes used in tests that have no legitimate place in agricultural practice. This has resulted in stranding the teaching of agriculture upon the anomalies of the "run down farm," rather than upon the essentials. Sanity brings proper recognition to the industry which never was efficiently utilized in teaching the country boy and girl. This applies equally well to towns and small cities that are only densely populated rural communities.

The elementary school curriculum begins where the child's interests are. From this little fund of information, nature study is graduated from the first to the eighth year in the school course. It is confined mainly to study of the useful plants, animals and minerals of the community, the seasonal nature of the farm activities, the life history of the plant crop and its use to the community. This work is taken up in seasonal sequence in every grade and systematically developed and presented every Wednesday.

Attention is called more specifically to the great industry of the community by the use of a text in agriculture, which is covered in two recitations per week in two years, the seventh and eighth. The topics are also followed in seasonal sequence, each month receiving about sixteen lessons, eight of which are used in the seventh year and the others in the eighth year. In this way

the field is quite thoroughly investigated.

Once every two years a rural arithmetic is used for a half year to show particularly the application of specialized arithmetic to the solution, or, consideration of farm problems with the number sense. This is also used in the seventh and eighth grades in all the schools.

In the village where the school is large enough, the seventh and eighth grade boys have the regular text in agriculture, while the girls use a text in gardening which has practically all the underlying theory that the general agriculture has. This division gives a little special application in relating the use of facts, ideas and methodical thought processes to the solution of the problems which are confronting the individual. Gardening is generally the specialized occupation of the girls, while general farming is that of the boys.

A full year is given to the course in agriculture in the first year of the high school. The boys class follows an advanced text in recitations three times per week, and in the laboratory in double periods twice per week. The text is supplemented with references to texts on general and specialized farming, agricultural reports and bulletins. The girls' class supplements the regular text with a text on gardening, studied intensively in class, and then the regular references available on special phases of agriculture that lend themselves particularly to their tastes.

Agriculture is followed by a full two

years each in botany, chemistry and physics in the last three years of the high school. In each of these sciences the fundamental principles and theories are given ample illustration and application in the basal agricultural industries. Vitality of seeds, strength of stems, injurious fungus growths, qualitative soil chemistry, plant foods identified by chemical tests, mechanics on the farm and in the home, soil physics, chemistry applied to the household problems, etc., are a few of the various ways that are used from year to year as opportunities present themselves appropriately.

The basal information and scientific technique are essential to any collegiate, professional or vocational course, and not specialized, as is assumed by so many who advocate instruction in agriculture to obtain an agricultural education. This is shown by the fact that a great majority of the graduates of the secondary course pursue their studies in the liberal arts departments in the colleges and universities, and not in the colleges of agriculture, as might be expected from the way the curriculum in the elementary and high school is built.

All that educational agriculture does for our pupils is to utilize their environment to give them an education that is the equal of any in the city. To recognize that some phases of agriculture are the worthy basis of the school curriculum, and that other features of industrial agriculture are vocational in their nature, is the beginning of sane agricultural pedagogy.

TEACHER NELL

MELVIN RYDER, '15

FOLKS always said that Floyd Jenkins was a good boy. Folks always seem to know what they are talking about when they pass judgment on a boy, too, so that the favorable verdict must be considered proof that Floyd was a good boy. The opinion throughout the northeastern part of River County was that Floyd was sort of unfortunate in his parents, and in that respect also were they about correct.

"'Tis a pity, Mrs. Guthrie, that Floyd has to live on that Jenkins farm, a down-right pity," Mrs. Sawvel commented to her neighbor at the church social, where Floyd, by reason of his parents, was not present. It was also by reason of his lack of Sunday-go-to-meeting clothes that Floyd stayed at home.

"You're right, Jim, that young Jenkins is a good lad, and a hard time he has of it, too, at that worn-out, weed-covered, run-down Jenkins place. I'll be hanged if I can see why the youngster works his head off, and never puts up a kick because he has to stay at home all the time and never gets to go nowhere," said Al Brandon, at the same social, as he watched most of the boys of 16 and 17 years enjoying themselves with the maidens of the same age.

Floyd was a good boy, and a hard worker. His parents were of the kind that would be called "poor whites" in the hills of West Virginia and Tennessee, but in the southern part of Ohio, they were not given that descriptive title that they deserved. Sixteen years old was Floyd, and big for his age. Ever since he was old enough to help, he had been the principal worker on the Jenkins farm. Sandy Jenkins, his

father, was shiftless, and his mother was as much so, if not more. Sandy had only one recreation, or one excuse for living, and that was his regular habit of going to town each week and partaking of the "cup that cheers," which might be better termed the "cup that blears." Usually Sandy made it a point to stow away a supply for his own particular use during the coming week, or the early part thereof, when he made his regular visits to the town.

Floyd ran the farm as best he could. He did the plowing and most of the harvesting, and never complained of his lot. In the winter time he had been going to school as much as he could, which meant usually the last three days of each week, when Sandy had finished his supply of "wet goods," purchased the Saturday before. Floyd was a good student, and well liked by the teacher and his fellows. Oh, yes, we must be truthful, and so we must include the girls, for Floyd was well liked by the country lassies that came to Trinity Center school. He had a way about him that was taking, and he never played tricks upon them, as did many of the other lads that came to the Center school in search of the fundamentals of learning.

School was all the recreation that was Floyd's. As soon as he went home he had to work hard until long after dark, and his rising hour was before that of the sun. Between you and me, Floyd was rather sensitive. It didn't show very much, but he was. He hated to think that he did not have the clothes and the spending money that the other boys had. He didn't, that's a fact. Sandy did little more in the way of clothing Floyd than the law demands.

A new suit of cheap overalls in the summer and some home-made shirts, with the heavy raw-hide boots and handed down coats in the winter-time, were given to Floyd, when he had to have them.

Young fellows have dreams, and Floyd was no exception. He worked away, and dreamed and thought, as many a boy has done and will do, as long as the springtime of life comes before the summer of maturity and the autumn of declining years. Floyd was not unhappy, we don't suppose. He worked in the ramshackle barn, and dreamed that he was in the Spanish air castle that is the dwelling place of every youth before he casts his first vote.

So despite the common knowledge that Floyd Jenkins was a sort of slave whose owners were of the driving, hard-hearted, kind-hearted kind that never heard of the eight-hour day or of the laws of gratitude. Floyd was not sour in his disposition, or discontented with his lot—until the new teacher came to Trinity Center. And that's our story that we have at last come to.

The new teacher at Trinity Center was unusual for that locality. First, she was a city girl, and second, third and completely, she was Nell Barkhurst, which is to say again that she was unusual. Nell Barkhurst, or rather Miss Barkhurst, as she was called by her students, was just out of high school, with a summer spent in a school where they attempt to teach one how to teach school according to the methods of modern educators. If Nell had remained in the city and taken a position there, Floyd would probably be working away on the Jenkins farm, his dreams less frequent and his outlook on life less clear and bright.

Doubt if Floyd would have returned

to school that year, if he had not met Miss Barkhurst the day that she first came out to Trinity Center to talk to the trustees and see if she might have the job. By mistake she came to the Jenkins farm in search of the trustee, and as it was Saturday, the regular Sandy was not at home. Mrs. Sandy was taking her afternoon sleep in the rocker in the kitchen, and as luck would have it, Floyd was at that moment coming out of the barn.

There wasn't what we might call love or any of the usual story-book happenings at first sight, when Nell Barkhurst asked Floyd Jenkins if his father was trustee of the school. Just the question, put in rather a pleasing, smiling voice, and Floyd, with a return smile, answered that his father was not a school trustee, at least, although he might be called a trustee when it came to other things.

"I'm tired. Would you mind if I sat down over there and rested a wee bit?" asked Nell, pointing with her parasol toward the tongue of the wagon, about the only possible place to sit that was handy.

"Tell you what you do, ma'am. If you'll wait a little bit I'll hitch up the wagon and we'll ride over to McCulloughs and you can see him, the trustee, you know," said Floyd, surprised at his own suggestion.

"On the hay wagon? What fun! Certainly, I'll be glad to get the ride. I'm about tired out. I've walked farther than I ever did before in my life," replied Nell. "Oh, I'm going to get right up there now, if you don't mind."

So Floyd hitched up the team, and they started toward McCullough's, about a mile's ride. In her frank way Nell told Floyd all about her hopes that she would get the job teaching, and about her schooling, and all sorts of

other things, while Floyd shook his head and watched her smile and smiled himself. When they found that the trustee was not at home, and that their journey was all in vain, Floyd was disappointed just because Nell was. So they decided, which is to say that Floyd decided, and Nell agreed, that they would ride back to the station on the hay wagon. Nell drove and yelled "Gid-Up" and swung the free end of the lines to make old Tom step along faster, and Floyd suddenly found that he and she were good friends and not a bit afraid of each other or of the English language used in conversation. They chatted and laughed, and she hummed a snatch of a song, and the team trudged along lazily. She wondered if she could drive standing up, and he bet she couldn't, and they tried it. She almost fell when old Tom took an extra step at the touch of the lines, and he caught her and they both laughed. They said goodbye, and he told her that he was going to be one of her pupils as she stepped on the train. If Cupid had been sitting on the baggage truck near by, he would probably have tossed up to see whether to shoot or to wait until the second meeting. Nell went home with the recollections of an afternoon of good fun and excitement and Floyd went back to the farm, wondering if Sandy would possibly let him get some decent clothes to wear to school. He wondered, or rather decided, to prepare his attack on the parental objections to his returning to the school. As the sun went down that evening, as Floyd was starting the milking, he looked across the fields and the clearing on the opposite hill, and his air castles were plainer before his eyes and he squinted his eyes a little, as you and I have done often

when we were sort of half-praying and wishing.

Floyd won, and he went to school. The clothes were harder to get, but with the aid of an agreement to work harder and longer, he persuaded the elder Jenkins to help him buy a suit. Adding the little sum that Floyd had accumulated, he bought a cheap outfit and went to school.

Say what you please, Floyd broke the letter of his agreement. He promised to work harder, which he did, but not harder at the farm work, as Sandy believed the contract to imply. Floyd didn't mean to slight the farm work, but school to him meant everything as soon as he became started. He worked hard at his lessons, after the chores were done, but began to stay after school and to talk to the teacher, when Sandy thought that he ought to have been home working. Floyd refused to go to school on his old terms of fifty-fifty, which were that he stay at home the first three days of the week, while Sandy was gradually sobering up, and go to school the last three days.

Open warfare between Floyd and Sandy might never have come if Sandy had stayed away from the schoolhouse. Several wordy arguments between himself and Floyd had driven him to town in the middle of the week, and he started home at dusk with a little more of the spirits of hops within than was his custom. Teacher Nell was still in the schoolhouse. She had been correcting papers and had remained later than was her habit. She was just about to start for Wiggins', where she boarded, and roomed, when Sandy came lumbering into the schoolroom. He started in at once telling her in his half drunken way that she would have to quit keeping Floyd from his work, and demand-

ing that "le'm alone." Nell was too sensible to reply and attempt to explain to him that she was in no way responsible for his actions, so she determined to go home and leave Sandy stay as long as he wished. When she attempted to get past him and to go toward the door, after she had put her coat and hat on and took up her books, she found that Sandy was even more furious. He told her that he was going to make her stay until she promised to get Floyd to quit school and stay away. This scared Nell and she made a dash toward the door. Sandy grabbed her and caught her coat, but Nell eluded him by slipping out of the coat and dashed through the door.

Sandy did not attempt to follow the teacher. He went back to the desk, where the light was, and sat down to wait for Nell to come back and get the coat. Here Floyd found him, fast asleep, three hours later when he went in search. The coat in Sandy's hands and the muttered sentences when aroused gave Floyd the story of what had happened. That was the last night that Floyd spent at the Jenkins farm. He took Sandy home, and then stayed at the schoolhouse until morning. He told Nell about his experiences the following morning and extracted from her the account of Sandy's actions.

"Nell, I'll tell you what I've been thinking of doing. I am going to ask Mr. McCullough to lend me the money and I'm going to start a huckster wagon and haul produce into the city. I know most of the farmers around here, and if I could secure a horse and wagon I am sure I could make a success," said Floyd to Miss Barkhurst. She agreed that the plan was a good one, and Floyd left before school started to see Mr. McCullough. Before noon he was back with the news that he had been

successful as far as securing the horse and wagon and some little capital to use in making the first purchases.

That winter was a busy one for Floyd. Day in and day out he worked at his venture, buying the produce from the farmers and hauling it three times each week to the city. Soon he built up a transfer business between the farmers and the city stores by delivering to the farmers all articles that they wished to purchase in the city. In this way, he always came home with a load as well as taking a load of produce to market. Before Thanksgiving Floyd tried a larger deal with turkeys and chickens and cleared over two hundred dollars in that week alone. The confidence of the farmers and Floyd's willing spirit and desire to be fair to them made him friends near and far, and he found an ever-increasingly prosperous business before him.

So the winter was spent, Floyd working hard at his huckster business and Nell teaching school at the Center. Floyd could not go to regular school, but at Nell's suggestion they spent at least an evening a week at Wiggins', where Nell and Floyd worked together on problems and advanced school work. Floyd was a rapid learner and spent the other evening in his small room at McCullough's, studying and working away at his books. The friendship that had sprung up between Nell and he grew daily. Except on the days when he had to drive into the city, Floyd usually arranged his routes so that he could spend the noon hour and eat lunch with Miss Nell at the Center.

The Center school was to have their closing exercises of the year on the last Friday in April. Nell had prepared a program, and all the parents were invited to attend. Speeches by several of the board of education and

the school trustees and stunts by the students made up the afternoon exercises.

Floyd was unable to attend, owing to his work, and it was after 4 that afternoon when he drove up to the Center schoolhouse to find that everyone had gone except Nell. She was going back to the city the next day. On the way to Wiggins' he told her of his hopes and plans and he told her that she had a part in all his plans. He found that he had made enough money to send him to the agricultural school for at least a year, and he decided to go the next year. What did Nell think of his plan, She was glad and told him so. And when he told her that she was the only girl in the world for him and that he liked her so much that he wanted her to share his plans, she did just what all girls should do in such a case, and cried a little and then told him that she wanted to do her part, too. So the two had a real good time, telling each other of their plans and talking

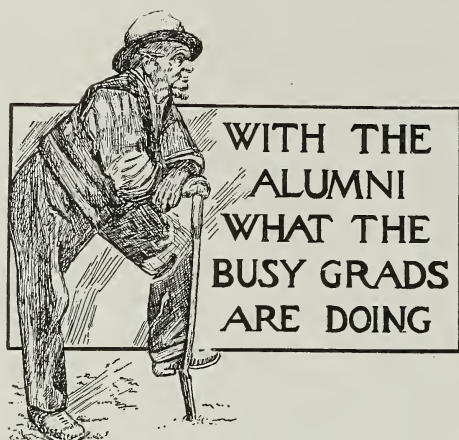
together at the same time, while the horses went slower and slower toward 'Wiggins'.

The next year and the next Floyd went to the state agricultural college. When his money gave out, McCullough gladly lent him enough to finish his course. In the summer time Floyd returned to the work of huckstering and hauling between the city and the district near his new home.

The last scene of this story is at the campus of the college where Floyd was to receive his diploma. It was commencement time and Nell had come up to the city with Mr. and Mrs. McCullough. The final day of his college life over, Floyd and Nell were strolling together across the shaded campus, mellowed in the late dusk of the summer's evening. There ends this story and begins the story that comes after such stories as these. We leave Floyd and Nell looking into the future, looking forward to living and loving—together.



Twenty Auto Loads of Students Returning from the Caldwell Breeding Farm. Passing Through the Overflow of the Scioto River, Near Chillicothe



Charles E. Snyder, '09, is editor of *The Farmers' Review*, published at Chicago. Since graduating Mr. Snyder has been instructor in animal husbandry at the University of Minnesota, animal husbandman in sheep and goat investigations, U. S. Department of Agriculture, Washington, D. C., and assistant editor of the *National Stockman and Farmer*, published at Pittsburg. *The Farmers' Review*, of which he is editor, is a weekly publication which is put out in the interests of the business farmer. He was editor of *The Agricultural Student* in 1908-09.

Raymond W. Palmer, ex-'14, of Pataskala, and Roxana Bell Wagy, ex-'14, were married at the home of the bride's parents at Summit Station on March 4. They will reside at Shady Nook Farm near Pataskala. Mr. Palmer will carry on livestock farming, making a specialty of breeding Shropshire and Southdown sheep.

Herbert L. Andrew, '15, who is assistant in farm management at the Ohio Agricultural experiment Station, Wooster, has been working on the cost account records of the Trumbull County experiment farm.

Thomas A. Wheeler, '15, is teaching agriculture in the high school at Moores Hill, Indiana.

D. R. VanAtta, '10, agriculturist for Hamilton County, gave six public spraying and pruning demonstrations during the week ending March 4.

Morris O. Bugby, '04, agriculturist of Trumbull County, has made the people enthusiastic over the possibilities of improving their dairy herds. Along with Ivan McKellip of the Ohio State University he has organized four cow-testing associations and two more will be organized soon.

Emery Poulson, '15, began work in the horticultural department at the Ohio Agricultural Experiment Station at Wooster on April 1. He is assisting in the plant breeding work.

C. A. Gearhart, '13, who is one of the force of Ohio Institute speakers, spoke at the Millersburg Poultry and Corn Association on March 11 and at the Crawford County Corn Improvement Association at Galion on March 13.

Harold R. Stillman, '14, is located at Andover, Ohio. He is engaged in dairy farming and is breeding Guernsey cattle.

Clarence Wildermuth, '15, assistant in the bureau of entomology, U. S. Department of Agriculture, is located at Maxwell, New Mexico.

Harry O. Stout, '15, is teaching agriculture in the high school at Fremont, Ohio.

Henry L. Wenner, '15, is practicing general farming at Carey, Ohio.

Paul Smith, '15, is located at West Unity, Ohio, where he is carrying on general farming.

Frederick F. Searle, '15, is managing a truck farm at Buckingham, Florida.

Earnest L. Salt, '15, is teaching agriculture in the high school at Brooksville, Ohio.

R. L. Schmidt, '15, is farming near Cleveland. His address is Brooklyn Station.

H. J. Reinhard, '15, is assistant state nursery inspector for Iowa. He is located at Ames, Iowa.

Charles McAnall, '15, is practicing livestock farming near Mt. Gilead, Ohio.

Dean L. Price, '15, is farming at Uhrichsville, Ohio.

W. E. Meeker, '15, is salesman for the Swift Fertilizer Company, with headquarters at Bethel, Ohio.

James E. Menching, '15, is assistant in the Institute of Animal Nutrition, State College, Pennsylvania.

Gabriel Mitchell, '15, is teaching agriculture at Rio Piedras, Porto Rico.

Harold H. Pickering, '15, is salesman for the National Farm and Provision Company at Columbus.

John W. Kyle, '15, is carrying on general farming on a farm near North Jackson, Ohio.

George McPherson, '15, is teaching agriculture in the high school at Williamsport, Ohio.

Kenneth G. Hancher, '15, is instructor in chemistry at the Michigan Agricultural College at East Lansing. Mr. Hancher was student assistant in agricultural chemistry at Ohio State University, 1914-15, and also a member of the stock judging team in the fall of 1914.

Lewis L. Heller, '12, is animal husbandman for the Department of Agriculture, Washington, D. C.

Arthur M. Bell, '12, is farming near Utica, Ohio.

W. C. Dutton, '12, is assistant horticulturist at the Michigan Agricultural Experiment Station at East Lansing.

Ralph Kenny, '12, is instructor in farm crops at the Kentucky Agricultural College at Lexington.

Claude B. Durham, '12, is assistant in horticulture at the Purdue Agricultural Experiment Station, Lafayette, Indiana.

Orville A. Jamison, '12, is instructor in animal husbandry at the University of Maine.

Louis W. Boving, '12, is farming at Carroll, Ohio.

Alva Benton, '12, is instructor in farm management at the University of Minnesota at Minneapolis.

Joseph F. Cox, '12, is instructor in farm crops at the Michigan Agricultural College at East Lansing.

Carl G. Fieldner, '12, is running a farm at Ney, Ohio.

E. D. Blaine, '12, is located on a farm at Mt. Sterling, Ohio.

Ralph B. Simon, '12, is teaching agriculture at Ohio Northern University, Ada, Ohio.

Clayton R. George, '12, is instructor in the extension department at Purdue University, Lafayette, Ind.

G. R. Rinehart, '12, is located at Rapidan, Virginia, where he is farming.

Harry Atwood, '15, is teaching agriculture in the high school at Highland, Ohio.

John L. Bard, '15, is farming near Girard, Ohio.

Albert O. Becker, '15, is teaching agriculture in the high school at Evanston, Wyoming.

Glen A. Boger, '15, is chemist with the John Wildi Evaporating Company, Lewisburg, Pa.

Robert B. Dustman, '15, is teaching agriculture in the high school at Shinnston, Ohio.

Olin H. Smith, '15, is assistant in soil survey work at the Ohio Agricultural Experiment Station at Wooster.

Edward L. Steele, '15, is teaching agriculture and manual training at St. Olaf College, Northfield, Minn.

David C. Reisling, '15, is managing a fruit farm at Mingo Junction, Ohio.

William G. Phillips, '15, is farming near Cadiz, Ohio.

Clifford J. Faucett, '15, is an instructor in animal husbandry at the New Hampshire, Agricultural College, Durham, N. H.

Ralph A. Routsong, '14, is employed by the Dayton Engineering Laboratories Company at Dayton.

Henry A. Wilson, '15, is teaching agriculture in the high school at Normal, Alabama.

Frederick Denison, '15, is farming near Mt. Sterling, Ohio.

Carl F. Eickhorn, '15, is farming at Barnesville, Ohio.

W. S. Krout, '15, is teaching plant pathology and botany at the New Jersey Agricultural College, New Brunswick.

Boyce E. Bradford, '15, is teaching agriculture in the high school at Cambridge, Ohio.

F. N. Pattengell, '15, is dairy herdsman at the Ohio Agricultural Experiment Station at Wooster.

John O. Barkman, '15, is manager and buttermaker of a creamery at Falmouth, Ohio.

Aden F. Huber, '15, is farming at DeGraff, Ohio.

W. W. Blair, '15, is located on a farm near Hiram, Ohio.

Horace A. Steuve, '15, is assistant fertilizer chemist for The Abattoir Company at Cincinnati.

Harley C. White, '12, is farming at North Fairfield, Ohio.

J. Arthur Taylor, '12, is located on a farm near Peoli, Ohio.

Earl Chenault, '15, has accepted a position with the U. S. Department of Agriculture and is accompanying George Livingston, formerly professor of farm crops, in his study of grain marketing in the Mississippi Valley.

Joseph P. Hershberger, '12, '15, has been appointed county agriculturist for Highland County.

Paul C. Kitchin, '15, is instructor in botany at the Michigan Agricultural College at East Lansing.

C. F. Griswold, '15, is assistant in plant physiology in the bureau of plant industry, U. S. Department of Agriculture, Washington, D. C.

Clair E. George, '15, is state dairy inspector, with headquarters at Delta, Ohio.

Arthur H. Gabriel, '15, is teaching science in the high school at Rockford, Ohio.

W. W. Ellenwood, '15, is superintendent of the S. J. Patterson estate, Coalton, Jackson County, Ohio.

L. P. Foster, '15, is in the fruit business at South Point, Ohio. He was a member of the staff of The Agricultural Student, 1914-15.

Lee E. Earnhart, '15, is practicing dairy farming on a farm near Waynesville, Ohio.

Raymond E. Copeland, '15, is principal of the high school at Mt. Sterling, Ohio.

Harry P. Curtiss, '15, is teaching agriculture and manual training in the high school at New Province, Iowa.

Richard Faxon, '10, is orchard inspector for the Montana State Board of Horticulture.

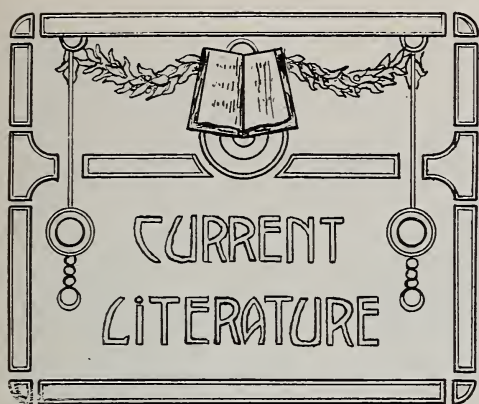
E. G. McCoy, '15, is in the employ of the John Wildi Evaporating Company.

R. H. Hartsook, ex-'15, is now with the John Wildi Evaporated Milk Company at Ridgeway, Ohio.

Tom L. Smith, '14, is superintendent of the Warrior Mountain Orchard Co., Old Town, Md.

Roland W. Rodgers, '08, is operating a horticultural farm near Cincinnati, Ohio.

W. C. Herrod, '07, is with the bureau of animal industry, South Omaha, Neb.



"The Vegetable Garden," by R. L. Watts, deals with the use of hotbeds, cold frames and greenhouses in the growing of vegetables; it also takes up tillage problems, stable manures and cover crops, commercial fertilizers, seeds, marketing, the home garden and cultural directions. It also discusses a number of the vegetables and their importance for the home garden. 186 pages, illustrated, 75 cents. The Outing Publishing Co., New York.

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"Apple Growing," by M. C. Burritt, deals with planning and growing the home orchard, pruning the trees, cultivation and cover cropping, manuring and fertilizing, insects and diseases of the apple, spraying, harvesting and storing, markets, renovating old orchards and the cost of growing apples. The subjects are treated fully as secured from practical experience. 177 pages, illustrated, 75 cents; The Outing Publishing Co., New York.

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"Laboratory Problems in Civic Biology," by Hunter, deals with the environment of plants, the function and composition of living things, plant growth and nutrition relating the same to practical agriculture, the relation of plants to animals and the economic im-

portance of animals. All the chapters deal with things that are found in the home, hence the use of the book for teachers has been found to be especially valuable. Questions are given at the end of each chapter which make reviewing simple. American Book Co., Cincinnati.

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"The Small Grains," by Carleton, presents the fundamental facts underlying agronomy in the present day training of students in agriculture. Four principal cereals are treated separately and from the individual plant standpoint as to their origin, characters, classification, varieties, selection and hybridization. Thereafter these cereals are treated in respect to soil and climatic relations, cultivation, irrigation, weeds, insects and fungous pests and uses. Citations of literature are made in the body of the text and refer to a bibliographic list in the appendix. 700 pages, illustrated, \$1.75; The Macmillan Co., New York City.

□ □ □ □

"Readings in Rural Economics," by Carver, is of particular timeliness, not only for the students of country life and its problems, but for that large class of general readers with a cultural interest in agriculture. The volume is not intended to take the place of any manuals on special subjects relating to rural problems, but is a handbook to be used in connection with other studies on rural life. The materials organized under these topics are: agricultural history (European and American); land tenure; agricultural labor; the farmer's business; rural organization and marketing; the granger movement and some suggestions to city persons who desire to farm. 974 pages, \$2.80; Ginn & Co., Boston, Mass.



APRIL NEWS NOTES

HORSE SHOW, MAY 6

With the Ohio Field instead of the University Hollow granted for the use of the Saddle and Sirloin to stage the annual horse show, the preliminary arrangements for the event are being quickly made, so that the exhibition can be held on May 6. Walter D. Hunnicut has been elected manager of the show.

Besides entries made by members of the Columbus Riding Club, a number of horses are being entered from Springfield, Dayton and Delaware. The ponies in the Fleischman Yeast Company contest will be entered in their respective event. There will also be exhibitions of high school and military horses.

Last year the show had a total of 109 entries and prizes amounting to \$200 were given. It will be possible to accommodate 5000 persons at the Ohio Field on the day of the show.

AG BANQUET APRIL 29

Friday evening, April 29, is the date set for the annual agricultural banquet, which will probably be held in the gymnasium, with the home economic students as guests, if the plans of the committee are carried out. A speaker of national reputation is assured by Dean Alfred Vivian, who will act as toast-

master. Clifford T. Conklin will respond in behalf of the senior class.

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Six editors and one business manager of Ohio State University publications since 1909 are now engaged in agricultural journalism with headquarters in Chicago. They include three editors and one business manager of the Agricultural Student, the first editor and one of the founders of the Sun Dial and one editor of the Daily Ohio State Lantern.

Samuel R. Guard, editor of the Agricultural Student in 1911-12, is associate editor of the Breeders' Gazette and professor of animal husbandry at the Chicago Veterinary College. Glen G. Hayes, who was business manager of the Student the same year, is editor of American Farming, a paper that is rapidly forging to the front among the leading farm journals of the country.

Clyde A. Waugh, one of the founders and the first editor of the Sun Dial, is the third member of the class of 1912 to locate in Chicago. After graduation he joined the staff of the Ohio Farmer, where he remained until he accepted a position as manager of the editorial department of the Soil Improvement Committee a year ago last July. J. W.

Henceroth, editor of the *Agricultural Student*, 1913-1915, became assistant agronomist for the Soil Improvement Committee at about the same time. He was the fourth of the sextette to reach Chicago. His work as assistant agronomist includes the preparation of stories dealing with soil improvement for the agricultural papers, the writing of bulletins and other journalistic work.

Melvin Ryder, last year editor of the *Daily Ohio State Lantern*, is another recruit to take up agricultural journalism in Chicago. He withdrew from Ohio State University, where he was a junior in the college of law, to take charge of the newspaper publicity work as assistant manager editorial department of the Soil Improvement Committee.

O. M. Kile, who was editor of *The Student* in 1912-13, became identified with the Soil Improvement Committee on February 1, 1916. He resigns as editor of publications in the University of West Virginia, Morgantown, to accept the eastern office of the Committee at Baltimore, Md. He has contributed to farm papers for several years.

Charles E. Snyder, editor of *The Student* in 1909-10, is editor of *The Farmers' Review*, which is published at Chicago. For several years he was assistant editor of *The National Stockman and Farmer* at Pittsburg, Pa.

Seventy students in the department of animal husbandry, accompanied by Prof. J. S. Coffey and Prof. Donald I. Kays, went to Chillicothe March 25, where they judged and inspected the herd of Angus cattle owned by J. S. Caldwell & Son. Arriving at Chillicothe at 10:30 the students were taken to the Warner House for dinner as guests of Mr. Caldwell. The trip to the farm, which was 12 miles from Chillicothe, was made in automobiles furnished by

the Chamber of Commerce of Chillicothe. Water was flowing across the road 12 inches deep at several places. At the farm the students judged and placed three rings of cattle and examined other individuals which were representative types of Angus cattle. The Caldwell herd of Angus cattle is said to be one of the finest in the central West.

Virgil L. Overholt, specialist in rural engineering for the extension department, who has been giving lectures and demonstrations at the agricultural extension schools during the winter on the subject of bringing water into the home, is now holding demonstrations out on the farm along rural engineering lines. Included in these demonstrations are farm drainage, planning and arranging of farm buildings, the construction of concrete watering troughs, septic tanks, and assisting the farmers wherever possible to arrange the water supply more useful and convenient to the farm buildings and the home. These demonstrations are being made on request of the farmer to the extension department long enough in advance so that the man on whose farm they are held will have time to get the materials ready and to invite in his neighbors so that they may witness the demonstration. The number of requests for these demonstrations has been large and at present Overholt is scheduled four weeks in advance.

Owing to the six weeks suspension of the work on the home economics building on account of the cold weather, a double force of workmen will be used in order to complete the building by September. The work on the new shop building has not been stopped, and it will be ready for occupancy by the beginning of the next school year. The

shop building, which is located north of Robinson laboratory, will have the largest area of any building on the campus. It will be 250 feet by 197 feet and two stories high.

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Uri F. Bruning of Pemberville and Lott E. Bechtol of Marion, seniors, having completed their work for the degree of Bachelor of Science in Agriculture, left on March 24 for Pemberville, where they began work on a 240-acre farm. They will follow general and livestock farming during the coming summer, but they expect to gradually work into the dairy business. Mr. Bruning was track manager during the present year, 1915-16. Mr. Bechtol was a student assistant in the department of dairying.

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With 43 counties signed up to conduct boys' and girls' contests in poultry and pig raising, potato and tomato growing, the indications point to a state-wide movement in the contest idea, according to W. H. Palmer of the extension department, who is state leader for Ohio. Three of the winners from each county will be given a free trip to Farmers' Week next year. Practically all the counties where livestock judging contests were held last year are interested in the work this year.

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Prof. Paul L. Vogt, head of the rural economies department, is the instigator of a plan whereby juniors in the college of agriculture will be given special survey work to conduct during the vacation months. He plans to have the students organize and conduct young people's clubs in their home communities.

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Aiding in the securing of funds for the erection of a new sheep building for the University, the Saddle and Sirloin

Club has voted to set aside \$60 as a scholarship to any present or prospective student of the college of agriculture who secures the largest number of fleeces. The prize will be awarded on February 1, 1917.

Prof. Charles S. Plumb, head of the department of animal husbandry, in an effort to reach every sheep man in Ohio, has sent out circular letters asking each of them to contribute one fleece to the University, which is to be sold and the funds used in the erection of the building. Each fleece is valued at two dollars, and as there are 70,000 sheep raisers in the state, a fund of \$140,000 is possible, while only \$25,000 is needed for the building.

In the letter it is explained that the University has only a \$200 barn for its flock of 125 sheep. The proposed building will be a memorial to Seth Adams, who introduced Merino sheep into Ohio. It will be constructed of brick, with classrooms in the front and the pens in the rear.

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SHEEP SHEARING CONTEST

With four classes offering \$42.50 in prizes, the annual sheep shearing contest of Ohio State University was held on April 12 at the judging pavilion under the auspices of the department of animal husbandry. The classes consisted of shearing with a hand shearing machine, shearing with a power machine, shearing with hand shears by professionals, and the last was a hand shearing contest among boys not over 15 years old. Mr. F. E. Beebe of Delaware, who is an expert in the shearing of wrinkly Merinos, gave an exhibition of this kind of work on these sheep. In the afternoon the Ohio Association for the Promotion of Purebred Sheep held its regular meeting and was addressed by sheep men of Ohio.

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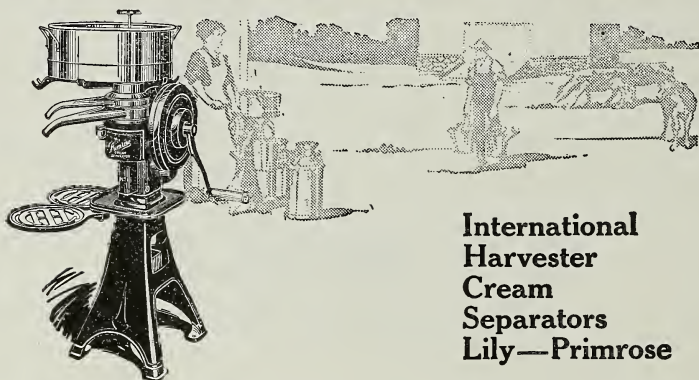
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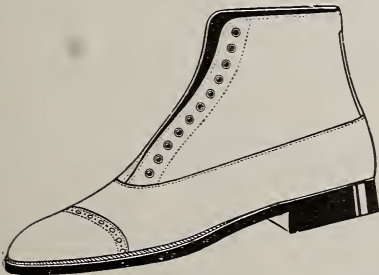
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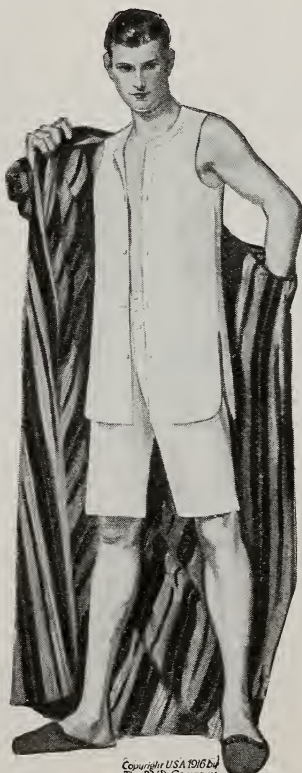
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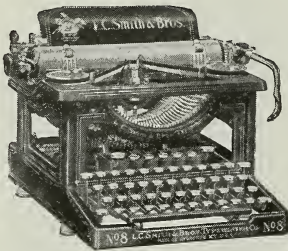
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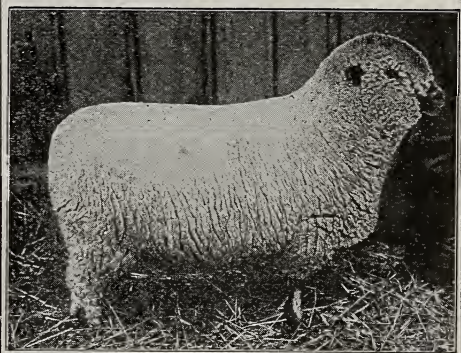
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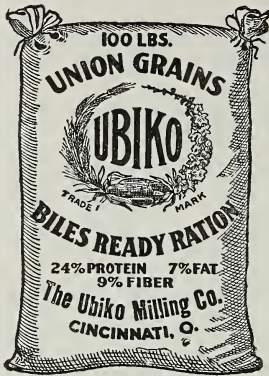
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UNION GRAINS is used on herds belonging to the U. S. Government—on state institutional farms everywhere—by the largest dairy establishments in Ohio.

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Tagged 38.62 to 43% Protein.

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The Ohio State University maintains a herd of swine, including Duroc - Jersey, Berkshire and Large Yorkshire breeds. We select and breed with special care. We sell no culls for breeders. We offer a limited number of selects during the year. For further information address

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conclusively that for pure dairy type, economy of production, richness of milk, long life and adaptability to feeds and climates—all these combined—she stands way above them all. This book "About Jersey Cattle" is free. Get your copy now. You'll find it mighty good reading.

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ENTIRELY a new book—new chapters—tells facts about every type of silo—home made, stave, brick, cement, tile, metal, pit, etc. Tells best for your needs—impartial suggestions for making most profits. 264 pages—10 page index—Copyrighted Nov. 1914, covers 41 silage crops. Send for new book; it beats all previous editions. Write today. Mailed for 10¢. Mention this paper. Silver Mfg. Co., Salem, O.

There is a difference between fruit growing and forestry

yet most of the directions for fruit growing are directions for producing rapid wood growth only.

This means coming into bearing late and irregular bearing on account of lack of enough available mineral plant food to raise a crop of fruit and to set strong fruit buds in the same season.

POTASH

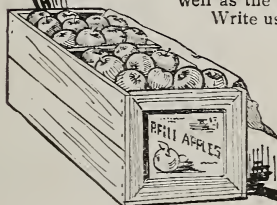
Two years before the trees are expected to come into bearing the annual application of minerals should begin, using 50 to 100 pounds Muriate of Potash and 100 to 200 pounds of bone, acid phosphate or basic slag per acre.

Potash improves the flavor, shipping quality and keeping power as well as the yield of fruits.

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CAUGHT 51 RATS ONE WEEK

Trap resets itself; 22 inches high. Will last for years. Can't get out of order. Weighs 7 pounds. Twelve rats caught one day. Cheese is used, doing away with poisons. This trap does its work, never fails and is always ready for the next rat. When rats and mice pass device they die. Rats are disease carriers; also cause fires. These Catchers should be in every school building. Rat catcher sent prepaid on receipt of \$3. Mouse catcher, 10 inches high, \$1. Money back if not satisfied.

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A Remedy for All Live Stock

A standardized coal-tar disinfectant, lice-killer, animal dip.

Always the Same

Destroys disease germs, cures skin troubles. Used and endorsed by

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CREAM

The choicest part of a thing is oftentimes referred to as the "cream."

It is entirely fitting when discriminating between the various materials available for dairy cleaning purposes to label those which are the best suited for this need as the "cream." That

Wyandotte
Dairyman's
Cleaner and Cleanser

Indian in Circle



in every package

is truly the "cream," and that it differs from other materials sometimes used for the purpose of cleaning, as greatly as real cream differs from skimmed milk, are facts easily appreciated by those who have had occasion to investigate thoroughly the problem of dairy cleaning.

And what is of still more vital consequence is that the cleansing service obtainable from Wyandotte Dairyman's Cleaner and Cleanser is as superior to the service rendered by other materials as the peculiar qualities of cream are superior to other milk properties.

If you happen to be one of the few not using Wyandotte Dairyman's Cleaner and Cleanser why not determine to test these facts for yourself? Then ask your dealer for a sack, or write your regular supply man for a barrel or keg.

The J. B. Ford Co., Sole Mfrs., Wyandotte, Mich.

This Cleaner has been awarded the highest prize wherever exhibited.

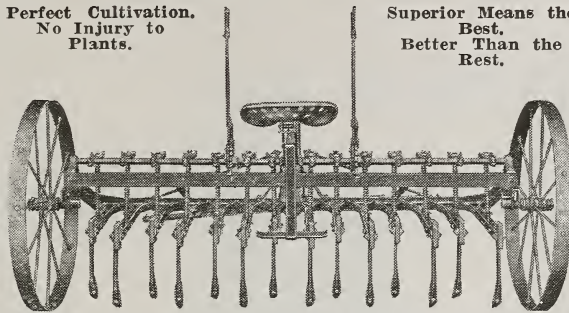
It Cleans Clean.

"The Name Tells the Story"

SUPERIOR ALFALFA CULTIVATOR

Perfect Cultivation.
No Injury to
Plants.

Superior Means the
Best.
Better Than the
Rest.



Especially designed for the proper cultivation of Alfalfa, but is also an excellent implement for preparing any seed bed.

Operator sits well behind the work and can see what is being done. Levers within easy reach. More or less pressure can be instantly applied to suit ground conditions. Also, should Cultivator "load up" with trash or the hay left from cutting, operator can immediately free the machine.

Th important things in cultivating Alfalfa are: Thorough cultivation of the soil, without injury to crowns and roots, and the eradication of weeds.

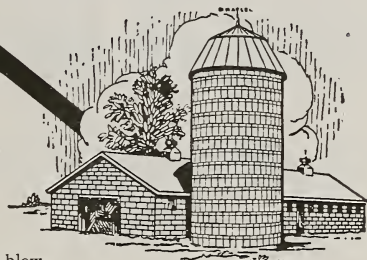
The Superior is so constructed that the teeth move from side to side and work around the roots and crowns.

When you injure an Alfalfa root or crown, decay sets in, the plant becomes sickly and finally dies.

THE AMERICAN SEEDING-MACHINE CO., Inc., Springfield, Ohio

Settle the Silo Question

—and settle it for good. Do away with repairs, with tightening of lugs and adjusting of hoops. *Know* that your silo won't blow over. Be sure of perfect silage at all times, Build the worryless, efficient



A Natco Silo and a Natco Barn mean Permanency and Prosperity.

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Its hollow, vitrified, clay tile are impervious to air and moisture—they preserve the silage *sweet* and *juicy*. The dead air spaces in the wall resist frost—making it the silo for severe climates. The continuous, reinforcing bands laid in the mortar hold it in a grasp of steel. It is a silo of *efficiency*, and a silo you'll be proud of. Send for our silo catalog describing it fully.

Also get our splendid new book, "Natco On The Farm," describing other farm buildings made of Natco Hollow

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Notice steel reinforcing
bars laid in the channel.

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23 Factories—Prompt Shipments.

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You have cream to sell
Pick your best market
Thousand of satisfied
shippers say
The Ohio Dairy
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Why not try it?

THE OHIO DAIRY CO.
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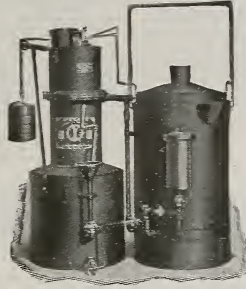
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Big, full gauge wires—full weight—full length rolls woven with a mechanically hinged joint. Superior quality galvanizing—proof against hot sun, sleet and snow.

American Steel Fence Posts, cheaper than wood and more durable. Last a lifetime. Hold fence secure against all conditions.

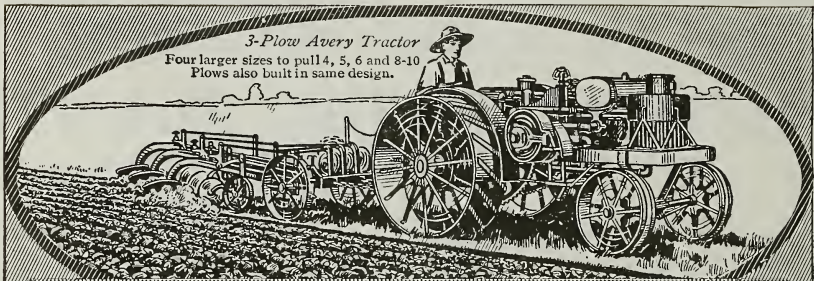
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Write for booklet on how to set posts and erect fence. Every farmer should have it.



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STUDY over these special features in the design and construction of Avery Tractors and you will know why so many men are buying Avery Outfits. There are more acres plowed by Avery Tractors and Plows than by any other make. What they are doing for others they will do for you. These are some of the reasons why it will pay you best to get an Avery:

First—Avery Tractors have a special sliding frame which makes possible the elimination of the intermediate gear, shaft and boxings. An Avery Tractor has the least gears, the least shafting and the least bearings of any two-speed, double-drive tractors built—which means more power and longer life.

Second—Avery Tractors have two rear drive wheels and two speeds—a big advantage over single-drive and one-speed tractors.

Third—Avery Tractors have slow-speed, heavy duty opposed motors—not high-speed, light automobile motors.

Fourth—Avery crankshafts are one-half the diameter of the cylinder or more. There has never been a broken Avery crankshaft.

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Sixth—Avery Tractors are entirely free from

all pumps and fans. All such easily broken and troublesome parts are done away with in the construction of an Avery Tractor.

A Complete Outfit Built by One Company

—the plow as well as the tractor. All built and backed by a company having a large factory and many branch houses, which insure prompt and permanent service. Avery "Self-Lift" Plows are built in all sizes from 3 to 10 bottom. We also build the "Yellow-Pellow-Grain Saver" Separator in sizes to fit each size tractor.

Avery Tractor Prices—3-Plow Tractor, \$760 cash; 4-plow, \$1120 cash; 5-plow, \$1650; 6-plow, \$2145; 8-10-plow, \$2475. We also build a special smaller size tractor for \$255.

Write for new 1916 Avery catalog and investigate farming, threshing, road-building, etc., with an Avery Tractor.

EVERY COMPANY, 4853 Iowa St., Peoria, Ill.

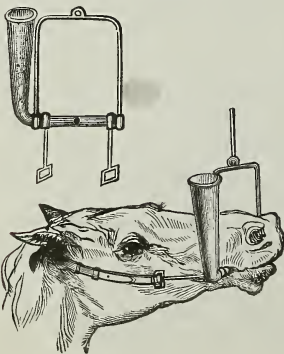
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Advertising space in special May "Live Stock" issue will bring results



Special Cash Price, postpaid, \$2

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Absolutely the best value in a Self-Filling Fountain Pen ever offered. Can be refilled in a few seconds from any inkwell. (See Illustration.) and one filling will write about 25 pages of note paper.

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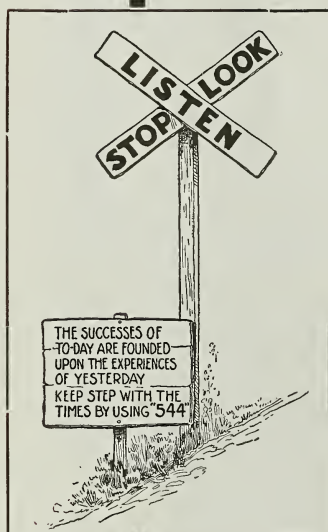


USE

FOR

The Treatment and Prevention of Hog Cholera

READ THE FOLLOWING UNSOLICITED LETTER—IT TELLS
THE WHOLE STORY



Seaford, Delaware, Jan. 19, 1916.

The Thiele Laboratories Co., Columbus, Ohio.

Gentlemen:—It has been the writer's intention for some time to write you, giving you a full report on the wonderful success we have had in using your "544" for the prevention, treatment, and let us make here the strong statement, proven by facts, cure of hog cholera.

As you are aware from our previous correspondence, we are among the largest swine breeders in the East. Four years ago we inoculated hog cholera into our herd by using a non-potent serum. Up to that time we had a perfectly clean plant, but were surrounded by cholera. During that year we lost one hundred and sixty-four, including boars, sows, shoats and little pigs. This called for quick action; something had to be done or go out of the business.

We then took up the double or serum-virus treatment. Our first treatment, or rather inoculation, proving about 75 per cent immunized hogs. We continued with this treatment till we began using your "544." Later results with this simultaneous treatment had proved about 75 per cent to the bad. Hogs treated died of cholera.

This year, with cholera all around us and hogs dying in hundreds, we had but fourteen cases. These were all pigs from four weeks to three months old, and we lost but four. We attribute both the fewness of cases and the recovery of ten sick to "544."

We note in your advertisements that you say "544" will cure hog cholera if taken in time, with proper treatment. This we think we can surely confirm, and gladly do so, from the above experience.

We herewith enclose you check to cover statement rendered, also thirty (30) dollars in addition, for which please send us at once six more bottles of "544." We wish to add that on receipt of this we will at once inoculate two hundred little pigs, ranging from three to eight weeks old. We also have fifteen more sows that will farrow within the next two months.

Awaiting your early reply, we beg to remain,

Very truly yours,

B. L. R./C

J. J. ROSS & SON.

If interested or further information is desired,
write for Free Booklet to

The Thiele Laboratories Co.
HARTMAN BLDG., COLUMBUS, OHIO

The Size of Your Cream Check

IS NOT CONTROLLED ENTIRELY BY THE PRICE

Paid You for Your Butter Fat

GETTING PAID FOR ALL OF YOUR FAT

Is What Counts Most.

WE GIVE EVERY "TENTH" IN BOTH WEIGHT AND TEST.

We Pay the Freight.

CO-OPERATION WITH US PAYS YOU

The Highest Possible Price.

SHIP THE NEXT CAN TO US—GET A BIGGER CHECK.

THE WEST JEFFERSON CREAMERY CO.

4 H.P. Cushman Weighs Only 190 lbs.
8 H.P. 2 Cylinder Only 320 lbs.

These are the only light-weight farm engines. **High speed and throttle governor**, with perfect balance, give **smooth, continuous flow of power and uniform speed** instead of violent, irregular explosions and fast and slow speeds of old-style engines. This explains why Cushman engines are so light in weight, yet more steady-running and more durable than engines weighing four or five times as much.

Only All-Purpose Farm Engines

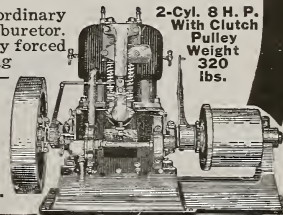
Besides doing all regular jobs, Cushman Engines may be used for so many jobs heavy engines cannot do. **4-H. P. is original binder engine**, also used on corn binders and potato diggers. **8 H. P.** used on hay balers, corn pickers, etc. **15 H. P.** weighs 780 lbs.; **20 H. P.** only 1200 lbs., for heavy duty.

Cushman equipment is much superior to that of ordinary farm engines. Friction Clutch Pulley and Schebler Carburetor. **20 H. P.** has gear-driven high tension Magneto. Cooled by forced water circulating system, permitting all-day run. Moving parts enclosed and run in bath of oil. Run at any speed—speed changed while running.

Cushman Engines are not cheap, but they are cheap in the long run.

If you want a real farm engine, to run without trouble and do all your work, you need the Cushman. Book free.

CUSHMAN MOTOR WORKS
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"Cukes" a foot and more long. Those are the kind.

There's Money in Greenhouse Cucumbers

YOU can grow a Fall and Spring crop, or one of tomatoes and one of cucumbers and arrange it so that you have a complete rotation and practically no idle ground except in the short off-crop time in the summer.

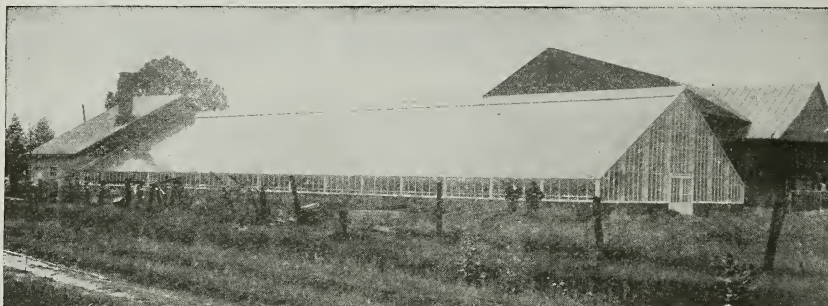
Right now greenhouse cucumbers are being shipped from the Mississippi Valley section of the West to New York and San Francisco.

The market hasn't begun to be supplied. One man who formed a stock company

and built five of our big houses, netted a good profit the first year, and has steadily increased it ever since.

Of course growing cucumbers requires skill—it is not exactly "finding money."

You put up the money and we'll put up the houses. You can hire a skilled grower; and with you on the job to look after things, it will be your own fault if your bank balance doesn't grow. Don't hesitate to write for any information. Do it freely.



Let us tell you how Farmer Topper came to build a greenhouse.

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Book of Barn Plans FREE

If you are going to Build a New Barn, or Remodel the Old One, you should have this book.

Why Not Build This Fall?

Louden Barn Plans is not a catalog of barn equipment. It is a complete and valuable book of reference and instruction on barn construction.

The 112 pages of Loudon Barn Plans are full of dollar-saving information. It contains 51 representative designs for cow barns, horse barns, combination and general purpose barns, as well as many other designs, for hog barns, pens, hay sheds, etc.

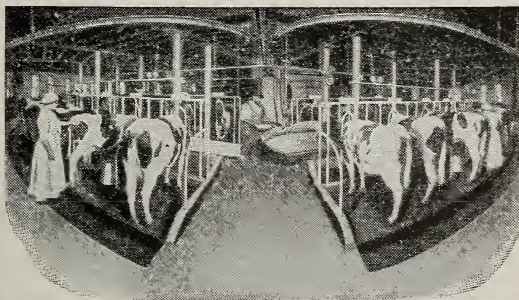
The advantages in each design in Loudon Barn Plans are pointed out, and estimate of construction cost is given. In addition, there are 32 pages devoted to general construction problems, such as concrete work, laying floors, roof construction, ventilation, etc.

When Writing for This Book, Please State When You Expect to Build, and How Many Cows and How Many Horses You Want to House

We have Designs for nearly 4,000 barns and our architects will give your letter personal attention if we learn your exact requirements.

Louden Barn Equipment

Louden equipment makes possible a clean, sanitary barn with a minimum of expense for upkeep. When cows are transferred from dark, dirty barns to Loudon barns, the milk flow often increases from 15 to 25 per cent, and the labor of caring for the herd is reduced one-third to one-half.



The cost of installing Loudon equipment is surprisingly small.

The Loudon Line Includes:

Litter Carriers	Cow Stalls
Feed Carriers	Horse Stalls
Hay Carriers	Mangers
Hay Loft	Manger Divisions
Equipment	Animal Pens
Bird Proof Barn	of all kinds
Door Hangers	Power Hoists

Catalogs Free

The Loudon Machine Co.

(Established 1867)

5200 Broadway, Fairfield, Iowa



**The
milk in
the pail the
cow kicks
over is lost
forever**

AND the butter-fat that goes into the can through the skim-milk spout of a cheap, inferior or worn-out cream separator is just as surely lost as the milk in the pail the cow kicks over.

The farmer who is trying to get along without a cream separator, or with an inferior or worn-out machine, is losing butter-fat right along, and butter-fat is money.

Thousands of Babcock and other tests have proved that the De Laval skims closer than any other cream separator under any condition, and particularly under the more difficult conditions so frequently experienced.

Just think what a loss of as little as ten cents worth of cream at each skimming means to you in a year—twice a day for 365 days—over \$70, and with as many as ten cows the cream losses alone from an inferior separator usually amount to more than this.

It doesn't matter whether the cow kicks the milk over or the cream separator doesn't skim clean, the waste is there just as truly in one case as in the other. The former is bound to happen once in a while, but it is always possible to guard against the latter by buying a De Laval Cream Separator.

**We will be glad to send one of our handsomely
printed and illustrated new catalogs to any farmer
or student interested in dairying, upon request.**

The De Laval Separator Company

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29 East Madison St. . . CHICAGO**

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